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GENTES HERBARUM

STUDIA CRITICA

Art. 5. Aliquot Coryphæ Americanæ
Art. 6. Palmæ novæ variæ
Art. 7. Neonicholsonia vs. Woodsonia
Art. 8. Clinosperma
Art. 9. Nomina nova Anthericorum
Art. 10. Notæ de Geraniis neogeis
Art. 11. Petronymphe genus novum Amaryllidacearum

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Bailey, Liberty Hyde

GENTES HERBARUM

Occasional Papers on the Kinds of Plants

CRITICAL STUDIES

5. Some American Coryphæ
6. Various new palms
7. Neonicholsonia vs. Woodsonia
8. Clinosperma
9. New names in Anthericum
10. Notes on New World Gerania
11. Petronymphe, a new genus of Amaryllidaceæ

by

H. E. Moore, Jr.

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88. Bactris militaris, habit. Photograph by Paul Allen.

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ARTICLE 5.
SOME AMERICAN CORYPHEÆ.

In November, 1949, the palm heretofore known as *Brahea* or *Acœlorraphe Pimo* was collected by Moore, Hernandez and Porras in two localities in the state of Michoacán, Mexico. In one area the trees were bearing heavily and collections of fruit were made dry and in liquid for future use.

Examination of mature fruit showed several differences from that of both genera in which the species has been placed. A study of these and allied American genera was undertaken, therefore, and a clarification is now attempted.

Beccari, writing about Brahea (Webbia ii, 92–107, 1907), discussed the two species then known, *B. dulcis*, (HBK) Mart. and *B. calcarea*, Liebm., both having solitary flowers, and described two additional species, *B. Pimo* and *B. salvadorensis*, that differed in having ternately glomerate flowers. Fruit of neither of the latter was known at the time but in the posthumous publication of Beccari's great work on the Corypheæ (Ann. Roy. Bot. Gard. Calcutta, xiii, 305, pl. 25 II, 1931) fruit of *B. Pimo* sent from Santa Barbara, California, by Franceschi was figured (fig. 5–8) and although of undetermined origin agrees well with fruit of the native trees now at hand (Fig. 89). There was, however, no change in alignment of species and the close relationship to Erythea, separated on the weak basis of costapalmate leaves, was not noted.

In 1935, H. H. Bartlett, writing on Corypheæ of Central America and Mexico (Carn. Inst. Wash. Publ. 461, 27–41), considered the glomerate-flowered Braheas better placed with the Caribbean genus Acœlorraphe, (correctly Paurotis, page 210) and to them added a third species, *A. Cookii* from Guatemala. He pointed out, however, that the addition of these species considerably broadened the limits of the genus.

That this placement is not harmonious becomes evident when mature fruits are compared. The fruit of Paurotis is the size of a pea, nearly globose and with no intrusion of the seed-coat into the endosperm. In contrast, the fruit of *Brahea Pimo* is plum-like, slightly flattened on the inner side with a blunt subapical stigmatic scar and a deep intrusion of the seed-coat below the raphe. Further differences of habit and habitat are elaborated in a synoptical key below. Fruit of the genus Erythea, similarly with ternately glomerate flowers, is identical in all essential characters with the fruit of the glomerate-flowered Braheas. The latter are transferred to Erythea below, extending the range of that genus to Honduras and El Salvador from a previous southern limit in Sinaloa,

Mexico. Brahea and Paurotis remain as smaller but homogeneous genera. Further discussions are found under the several genera concerned.

There are 19 genera of American Corypheæ, of which Brahea, Erythea, Paurotis and Serenoa form a discrete group characterized as follows:

Spadix elongate, much-branched with tubular-sheathing spathes on the primary axis and puberulent to tomentose (very rarely glabrescent) rachillæ: perianth in two cycles, the sepals free or shortly connate in a tube exceeded by the free lobes, the petals symmetric with excavate anther-pockets on the inner surface: fruit with apical or subapical stigmatic scar and basal abortive carpels; seed with plane or excavate but not ruminate endosperm.

The four genera may be distinguished by the following synoptical key:

A. Endosperm plane: ovary and young fruit glabrous: gregarious palms of coastal areas, North Carolina to Honduras.

B. Flowers ternately glomerate at base of rachillæ, sometimes paired or even solitary at tip, 2.5 mm. long or less, the petals more or less deltoid, about twice as long as sepals; sepals free or very shortly connate at the base; stamen-filaments united in a basal ring, the free portions short, rather abruptly narrowed from a triangular base: mature fruit globose, 8–10 mm. in diameter, the seed globose or depressed-globose with a short raphe scarcely more than half as long as the seed: petioles armed with stout widely-spaced spines 2 mm. long or more, hastula ligulate only on ventral surface: caulescent palms with slender stems to 10 m. high. Southern Florida, Bahamas, Cuba, Mexico, British Honduras, Honduras, Guatemala.....PAUROTIS

BB. Flowers paired or often solitary, 4 mm. long or more, the petals linear-lanceolate, about three times as long as the sepals; sepals united in a distinct tube; stamen-filaments shortly united at base, the free portions elongate and gradually narrowed: mature fruit ellipsoid, 15 mm. long or more; seed ellipsoid with a prominent raphe extending the length of the seed: petiole closely denticulate or serrate with spines less than 1 mm. long, hastula dorsally and ventrally ligulate: acaulescent or short-caulescent (very rarely to 8–9 m. high) palms. North Carolina to Florida and Louisiana.....SERENOA

AA. Endosperm excavate by intrusion of the testa below the raphe: ovary generally pubescent at least basally, the young fruit often densely canescent: solitary thick-set to tall palms of montane regions, Baja California to Nuevo Leon south to Honduras.

B. Flowers ternately glomerate at base of rachillæ, sometimes paired or even solitary at tip: mature fruit ellipsoid to subglobose, 20 mm. long or more, with blunt subapical stigmatic scar. Generally on neutral or acid soils, often in pine oak forest, Baja California, Mexico to Honduras.....ERYTHEA

BB. Flowers all solitary: mature fruit ellipsoid, 18 mm. long or mostly less, with apiculate stigmatic scar. Dry exposed calcareous areas or rarely in woodlands, Nuevo Leon, Mexico to Guatemala.....BRAHEA

PAUROTIS

Paurotis, O. F. Cook, in Mem. Torr. Bot. Club, xii, 21 (1902).

Acœlorraphe, Wendl. in Bot. Zeit. xxxvii, 148 (1879), nomen confusum; Benth. & Hook. Gen. Pl. iii, 882 (1883) as Accelorrhaphe nomen tantum; ex Becc. in Webbia ii, 107 (1907) as Acœlorhaphe.

Acanthosabal, Proschowsky, in Gard. Chron. ser 3, lxxvii, 91 (1925).

Arguments for the use of Paurotis instead of Acœlorraphe have been marshalled by Bailey (Gent. Herb. iv, 361–365, 1940) in agreement with conclusions of Burret (Notizbl. Bot. Gart. Berlin xii, 304, 1935). More recently Carabia (Caribbean Forester, vi, 160, 1945) has commented on the question and has considered Acœlorraphe proper. Leon (Fl. Cuba, i, 248, 1946) has maintained Acœlorraphe rather than Paurotis. This continuing confusion requires reexamination of the evidence.

Acœlorraphe was published by Hermann Wendland as a name in a key to sterile material of fan palms (Bot. Zeit. xxxvii, 147–148, 1879), the pertinent portion reading as follows:

Basale Blattränder und Hauptnerven nicht bedornt.
Blattränder und Blattwinkel braunwollig, Ligula sich in Fasern auflösend. ..... *Brahea* Mart.
Blattränder und Blattwinkel kahl (nicht wollig), Ligula trockenhäutig. ..... *Acoelorraphe** Wendl.
Basale Blattränder, sowie sehr häufig die Hauptnerven oberseits klein bedornt, Ligula hart lederartig..... *Copernicia* Mart.

*Die Beschreibung dieser neuen Gattung soll in Kurzem nachfolgen.

There the matter rested except for mention of the name by Hooker (Benth. & Hook., Gen. Pl. iii, 882, 1883) as a dubious or imperfectly known genus until Beccari, following herbarium notations of Wendland, applied the name to *Copernicia Wrightii*, Griseb. & Wendl., five years after Cook's description of Paurotis.

It can be argued that Acœlorraphe was validly published but it remains to be seen whether the name can be applied on its own merit. Wendland's intent is recognized through the later studies of Beccari and Burret but the genus must stand or fall on the original description since that alone was known when Cook described Paurotis.

Assuming that the genus was based on one or more previously described species of the alliance indicated in Wendland's key and not on an entirely new taxon, we may use Wendland's index to genera of palms in Kerchove's Les Palmiers (1878) as a guide to the species that he might have considered. Of the species listed, the following will come under the primary key heading with current names, when differing, in parenthesis: *Brahea dulcis*, (HBK) Mart., *B. serrulata*, (Michx.) Wendl. (*Serenoa repens*, (Bartram) Small), *Copernicia cerifera*, (Arruda Camara) Mart., *C. hospita*, Mart., *C. macroglossa*, Wendl. (*C. Torreana*, Leon (*C. macroglossa* pro parte) and *C. Burretiana*, Leon (*C. macroglossa* pro parte)), *C. tectorum*, (HBK) Mart. and *C. Wrightii*, Griseb. & Wendl. (*Paurotis Wrightii*, (Griseb. & Wendl.) Britt.).

Examining specimens, one finds that *Copernicia macroglossa* alone

keys properly to Copernicia. *C. hospita* and *C. tectorum*, although lacking spiny leaf-margins, generally have a hard leathery ligule and may be omitted from consideration on that account. The others, *Brahea dulcis*, *B. serrulata*, *Copernicia cerifera* and *C. Wrightii*, will key to either Brahea or Acœlorraphe depending on the condition of the leaf. All may have a tomentum of brownish fimbriate scales on the nerves below or above, at least when young. *Brahea dulcis* generally but not always retains a rather prominent tomentum in age while the remainder become superficially glabrous. The ligules of all are more or less membranaceous and break down to some degree but seldom become fibrous, even in *Brahea dulcis*. In strong leaves of *Paurotis Wrightii* and *Brahea dulcis* they are more nearly hard and leathery than membranaceous.

Etymology of the name (*) has suggested to Cook (Amer. Nat. xlviii, 313–314, 1914) that *Brahea serrulata* should be considered the basis of Acœlorraphe although Wendland refers to the species as Brahea several times in the text. Beccari (Pomona Coll. Journ. Econ. Bot. iii, 391, 1913), using the same evidence, concluded that *Copernicia Wrightii* fitted the description. The seed of *Copernicia cerifera* has ruminate endosperm but also lacks the excavate endosperm typical of Brahea and it may be considered similarly.

On the only basis provided by Wendland, that of leaves, the name Acœlorraphe may be applied to species now representing four distinct genera considering only taxa known at the time. Neglecting the character implied in the name and assuming that his intent were still unknown, one finds that the glabrous species of Erythea also fit the description. Paurotis, having been well defined and typified prior to Beccari's clarification, is the first generic name that can be definitely applied. It is easy to say in hindsight as does Carabia (l.c.) that "todos sabemos que ese autor (Wendland) se refería a una palma de Cuba y la cual, el con Grisebach, habian publicado anteriormente como *Copernicia wrightii*."

However, Wendland's original description is the only one that may be considered in deciding for or against Paurotis. That description, applicable to at least four genera, is no clearer today than in 1902 or 1879 and Acœlorraphe must be considered a nomen confusum.

Paurotis Wrightii, (Griseb. & Wendl.) Britt. ex Britt. & Shafer, N. Amer. Trees, 141 (1908).

Copernicia Wrightii, Griseb. & Wendl. ex Griseb. Cat. Pl. Cub. 220 (1866).

Serenoa arborescens, Sarg. in Bot. Gaz. xxvii, 90 (1899).

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* Without a hollow seam or raphe (not seed) from the Greek a (without) koilos (hollow) rhaphe (seam, suture or, botanically, raphe).

Paurotis androsana, O. F. Cook, in Mem. Torr. Bot. Club, xii, 22 (1902).

Acælorhaphe Wrightii, (Griseb. & Wendl.) Wendl. ex Becc. in Webbia, ii, 109 (1907).

Acælorhaphe Wrightii var. *novogeronensis*, Becc. in Webbia, ii, 113 (1907).

Acælorhaphe arborescens, (Sarg.) Becc. in Webbia, ii, 113 (1907).

Acanthosabal cæspitosa, Proschowsky, in Gard. Chron. ser. 3, lxxvii, 92 (1925); Bailey, in Gard. Chron. ser. 3, lxxvii, 396 (1925).

Brahea psilocalyx, Burret, in Notizbl. Bot. Gart. Berlin, xi, 1037 (1934); op. cit. xii, 155 (1934).

Acælorraphe pinetorum, Bartlett, in Carn. Inst. Wash. Publ. 461, 33 (1935).

Paurotis is here treated as a monotypic genus of wide distribution in the Caribbean area. The synonymy is rather extensive but examination of a considerable suite of specimens including type, isotype or authentic material of all species cited fails to indicate any clear-cut differentiation into specific or even subspecific categories. A second species, *Paurotis Schippii*, Burret, is discussed with Erythea where it probably belongs.

Specimens from Isle of Pines, Cuba (*Curtiss 449*), were distinguished varietally by Beccari and are matched by others from the province of Pinar del Rio. These specimens have generally shorter less pubescent rachillæ with crowded flowers subtended by often nearly smooth bracts. The sepals are scarcely puberulent or ciliate and the petals dry a very dark purplish-black with little or no pale margin in bud. Four spadices in the collection of *Baker and Abarca 4208* from Pinar del Rio show considerable variation and other intermediates from the same province (*Shafer 10620, Britton, Britton and Cowell 9614*) intergrade with the more typical phase that has lax, flexuous, often densely tomentose rachillæ generally more than 8 cm. long, slightly to strongly ciliate, often puberulent sepals and ciliate bracts with tufts of long soft hairs. The latter is more widespread in Cuba and occurs throughout the remainder of the range.

As Small has indicated (Journ. N. Y. Bot. Gard. xxiii, 69, 1922) characters of the leaf are not to be relied on as there is a considerable range of variation in size, glaucescence, armature of petioles and depth of division. Mature fruit varies within limits of 8–10 mm. in diameter but incompletely filled fruit may measure less. The floral characters relied on by Bartlett to separate his *Acælorraphe pinetorum* may be attributed to immaturity of the specimens and are to be matched by collections from Florida and Cuba.

A problem of typification arises with the destruction of the material

seen by Wendland at Berlin and Hanover. There are in the Gray Herbarium two sheets of the type number, *C. H. Wright 3217* (cited as 3207 by Beccari). One sheet, collected at Dayanique, has a leaf and portion of a spadix and is very similar to collections that might be allied to Beccari's variety. A second sheet from Hanabana consists of a spadix resembling more the widespread element but without a leaf and with a fragment of the inflorescence of *Copernicia glaucescens*, Wendl. ex Becc. The latter sheet, excluding material of *Copernicia glaucescens*, although rather intermediate in character seems more nearly to fit the original description of a palm with "spadices ramis gracilibus nutantibus pilosis (8″ – 4″ longis) . . . glomerulis remotiusculis" and is closest to other material cited by Beccari who had seen the holotype. It may, therefore, be considered a substitute for the type. Another collection of the same number, similarly mixed but without locality, is at the Missouri Botanical Garden.

Paurotis Wrightii is cultivated in Florida where it proves hardy as far north as Orlando. It is a pleasing palm forming compact clumps of slender stems clothed with sheaths that are a rich red-brown when young and crowned by stiffish green or blue-green leaves. The shining black fruits remain for some time on the drooping branches of the erect spadix.

In its native habitat, *P. Wrightii* is a species of coastal hammocks, savannas and swamps, the highest altitude recorded for it being 150–180 metérs in Guatemala. It is native in southern Florida (Collier, Dade and Monroe counties), the Bahama Islands, Cuba (provinces of Camaguey, Santa Clara, Havana, Pinar del Rio and Isla de Pinos), Mexico, British Honduras and is reported from near Puerto Arturo, Honduras, by P. H. Allen in correspondence. An incomplete and seemingly abnormal specimen from Puerto Rico (prope Utuado ad San Andres, *Sintenis no. 6512*, US.*) with portions of the spadix only is referred here with question. No other collection from Puerto Rico has been seen and more adequate material is needed to verify occurrence of the species on the island. A large series of specimens in the herbaria of the Bailey Hortorium, Chicago Natural History Museum, Gray Herbarium, Missouri Botanical Garden, New York Botanical Garden, United States National Herbarium and University of Michigan has been examined of which only the following limited number of pertinent collections need be cited:

United States: Florida; Chockoloskee River, Collier County, May and November 1898, *R. G. Corbitt* (A. type of *Serenoa arborescens*, NY. isotype).

Bahama Islands: Loggerhead Creek, Andros, *Northrop & Northrop 509* (NY. type of *Paurotis androsana*).

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*Abbreviations for herbaria throughout are those of Lanjouw, Chron. Bot. v, 143–150 (1939).

Cuba: Province Isla de Pinos; near Nuova Gerona, *Curtiss 449* (GH., MO., NY., isotypes of *Acælorhaphe Wrightii* var *novogeronensis*); Province Pinar del Rio; Herradura, *Baker & Abarca 4208* (GH., NY., US.); west of Guane, *Shafer 10620* (MO., NY., US.); Rio Guao, *Britton, Britton & Cowell 9614* (NY., US.); province not indicated; Hanabana, *Wright 3217* pro parte (GH., substitute for holotype), Dayanique, *Wright 3217* (GH.), without locality, *Wright 3217* pro parte (MO.).

Mexico: Campeche: Champoton, *Steere 1838* (MICH.); Tabasco: Achotal, Balansan, *Matuda 3070* (A., MICH.).

Guatemala: Department Alta Verapaz; south side of Cerro Chinaja, between Sachaj and Sacacac, alt. 150–180 m., *Steyermark 45172* (F.); Department Izabal; Punta Palma across bay from Puerto Barrios, *Steyermark 39800* (F.).

British Honduras: District Belize; Belize, *Bartlett 11201* (MICH., type of *Acælorraphe pinetorum*, BH., US., isotypes); District El Cayo; Mountain Pine Ridge, *Bartlett 11814a* (MICH.); district not indicated; Manatee Lagoon, *Peck 241* (GH., isotype of *Brahea psilocalyx*).

Cultivated: Porto Alegre, Brazil, *Dr. Francisco d'Aquino* (BH., authentic material of *Acanthosabal cæspitosa*).

SERENOA

Bartlett (Carn. Inst. Wash. Publ. 461, 34, 1935) stated that he found no distinction of generic importance between Serenoa and Acœlorraphe (i.e., Paurotis) in its broadest sense and suggested that if Acœlorraphe were not considered a valid name that the species be transferred to Serenoa. Although the genera are closely related there are differences strong enough to warrant their retention as separate taxa at our present level of understanding. The contrast in the synoptical key is purposely expanded to account for such retention.

ERYTHEA

The species of Erythea hitherto known have been discussed by Bailey (Gent. Herb. iv, 85–118, 1937) and need not be considered further at the moment. Reasons for the transfer to the genus of three species placed in Acœlorraphe by Bartlett have been indicated above. Investigation of the more ample series of specimens now at hand leads to the belief that only two species treated by him may be clearly recognized, the third being reduced to synomymy, while another, described by Burret as *Paurotis Schippii* and probably of this alliance, remains questionable. The first two, while clearly close to the more northern species of Erythea, may be separated at once by obvious vegetative and floral characters summarized as follows:

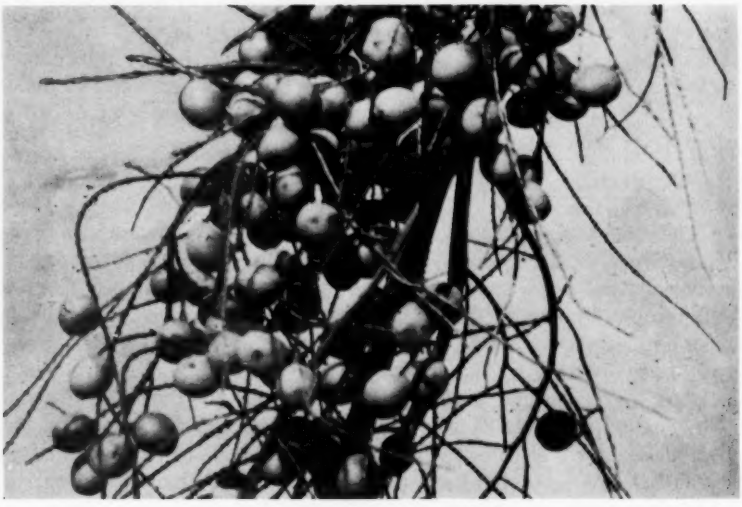
A. Leaves prominently lepidote-tomentose below, at least when first expanded, with medifixed deciduous-fimbriate scales persistent by the shining base between the veinlets at maturity: sepals without scarious margins.
B. Sepals, petals and ovary densely white-canescent at anthesis. Central Mexico.....*E. Pimo*
BB. Sepals glabrous at margin, petals glabrous or with a patch of hairs at base; ovary glabrous at anthesis becoming canescent basally upon enlargement after fertilization. Guatemala, El Salvador, Honduras.....*E. salvadorensis*
AA. Leaves glabrous below or nearly so, sometimes with sparse deciduous scales along the midveins but persistent scale-bases lacking between the veinlets: sepals with scarious margins.....*E. aculeata, armata, Brandegeei, clara, edulis, elegans.*

† **Erythea Pimo,** (Becc.) trans. nov. Fig 89.

Brahea Pimo, Becc. in Webbia, ii, 103 (1907); Ann. Roy. Bot. Gard. Calcutta, xiii, 305, pl. 25 II (1931).

Acœlorraphe Pimo, (Becc.) Bartlett, in Carn. Inst. Wash. Publ. 461, 32 (1935).

Erythea Pimo is a common tree with trunks to 2 meters high or more in the pine and oak woods below Uruapan, Michoacán, on the road to Apatzingán at elevations of 1100 – 1350 m., and is seen less frequently in similar situations in the mountains above Tzitzio on the road from Temascal, Michoacán to Huetamo, Guerrero. At anthesis the spadices are nearly erect and exceed the leaves but in fruit become more or less pendulous and are often heavily loaded with yellow plum-like blunt fruits (Fig. 89) quite distinct from the smaller ellipsoid apiculate fruit of Brahea. In its



89. ERYTHEA PIMO, mature fruit.

densely canescent calyx and corolla it differs from all other species of the genus now known.

Apparently this species has been cultivated for many years in California under the name of *Brahea Pimo*. Beccari had received fruit from Franceschi before his death in 1920 and in the herbarium of the Bailey Hortorium is a collection from young trees on the estate of J. Harrison Wright at Riverside, California, in 1927.

Label notes on a collection from a flowering tree on the C. B. Hale estate, Santa Barbara, indicate that this species has been grown under the horticultural name of "*Brahea calcarata*." Seed recently introduced from indigenous trees of Michoacán has germinated and is being grown by Mr. David Barry of Los Angeles, California and The Fairchild Tropical Garden, Coconut Grove, Florida.

The following specimens have been examined:

Mexico: Guerrero; Taxco, March 12, 1940, *L. H. Bailey 523* pro parte (BH.): México; District Temascaltepec; Barranca, Pungarancho, alt. 950 m., November 24, 1932, *G. B. Hinton 5250* (F., G-DEL., GH., MO., NY., US.): Michoacán; Monte de la Ventana, El Sirián, 14–1600 m., March 29, 1896, *E. Langlassé 82* (G-DEL. type, GH. isotype); Cerro Azul, vicinity of Morélia, alt. 1900 m., October 1909, *Bro. G. Arsène 2826* (US.); September 1909, *Arsène s.n.* (F.), August 17, 1906, *Arsène 66* (G-DEL.), September 26, 1912 *Arsène s.n.* (F.), October 20, 1910, *Arsène s.n.* (L.), August 3, 1909, *Arsène s.n.* (L.); La Escalera, Morélia, alt. 1600 m., November 6, 1911, *Arsène 6046* (L., US.); 9.3 miles from Temascal on road to Tzítzio and Huetamo, alt. 1920 m., November 13, 1949, *Moore, Hernandez & Porras 5721* (BH.); about 8 km. from Uruapan on road to Apatzingán, alt. 1330 m., November 14, 1949, *Moore, Hernandez & Porras 5749* (BH.).

† **Erythea salvadorensis,** (Wendl. ex Becc.) trans. nov.

Brahea salvadorensis, Wendl. ex Becc. in Webbia, ii, 105 (1907); Ann. Roy. Bot. Gard. Calcutta, xiii, 305, pl. 25 I (1931).

Acœlorraphe salvadorensis, (Wendl. ex Becc.) Bartlett, in Carn. Inst. Wash. Publ. 461, 32 (1935).

Acœlorraphe Cookii, Bartlett, l. c.

The type of *Erythea salvadorensis* was a portion of a spadix only and was lost with the great majority of other palm specimens when the Berlin Herbarium was burned. Beccari's description and illustration (Ann. Roy. Bot. Gard. Calcutta, xiii, pl. 25 I f. 1–2) are adequate to place it generically and to distinguish it from the remaining species now known.

Bartlett distinguished *Acœlorraphe Cookii* from *A. salvadorensis* as follows:

Ovary glabrous ..... *A. salvadorensis*
Ovary white-tomentose below, especially so as fruit develops, when basal growth of the tomentose part minimizes small apical glabrous portion. *A. Cookii*

Flowers of the type specimen of *Acælorraphe Cookii* are indeed as described, having been fertilized. Dissection of younger flowers of another collection from the type region, *Cook & Doyle 277*, reveals, however, that the ovary before fertilization shows no canescence at the base and is a good match for that of the flowers of *Brahea salvadorensis* in a comparable stage of development as illustrated by Beccari. The petals of the latter are described and illustrated as glabrous while *A. Cookii* generally has petals with a small canescent patch at the base. However, occasional flowers with glabrous petals are seen in *Cook & Doyle 277* and the distinctions scarcely seem sufficient to warrant retention of both species. Accordingly, *A. Cookii* is placed in synonymy of the older name. Although there has been no material from El Salvador available for study, the affinity of the flora with that of Guatemala lends further weight to the union.

E. salvadorensis is maintained as a species distinct from *E. Pimo* because of clear-cut differences in floral characters and a more southerly area of distribution in Guatemala, El Salvador and Honduras. That there is great affinity between the two species is clear and it is not unlikely that future collections will show them to be less easily separated specifically than at present. The following collections may be cited:

Guatemala: Department Alta Vera Paz; between Santa Rosa and Salama, May 29, 1904, *O. F. Cook & C. B. Doyle 275* (US. type of *Acælorraphe Cookii*, MICH. isotype), *276* (US.), *277* (MICH.): Department Baja Verapaz; rocky hills near and above Santa Rosa, alt. about 1500 m., April 4, 1941, *Standley 91181* (F.), *91260* (F.): Department Zacapa; upper reaches of Rio Sitio Nuevo between Santa Rosalía and first waterfall, alt. 1200–1500 m., January 9, 1942, *Steyermark 42198* (F.); southwest-facing slopes and bluffs, Loma El Picacho, above Santa Rosalía, 1200–1600 m., January 15, 1942, *Steyermark 42716* (F.).

Honduras: Department El Paraiso; vicinity of Manzaragua, Rio Yeguare drainage, 1400 m., April 4, 1948, *Williams & Molina 13990* (F.); Guinope, 1430 m., December 1943, *J. Valerio Rodriguez 1828* (F.): Department Morazán; slopes of Cerro de Uyuca, about 1500 m., November 25–December 5, 1946, *Standley & Williams 122* (F.); Valle Encantado on slopes of Mt. Uyuca, 1500 m., December 5, 1946, *Paul Allen 11182* (BH., F., US.); 12 kms. northeast of Sabana Grande near Los Artillos, 1000 m., December 23, 1947, *L. O. Williams 13590* (F.); slopes of Cerro de Uyuca, region of El Valle Encantado, 1300–1500 m., December 8, 1946, *Standley, Allen, Shank & Padilla 905* (F.); near Joya Grande, on road from El Zamorano to Suyapa, 1200–1350 m., February 25, 1947, *Standley & Molina 4522* (F.); Las Mesas, 900 m., November 23, 1946, *Standley & Williams 45*

(F.); El Quebracho, above El Zamorano, about 950 m., November 29, 1946, *Standley 323* (F.); near Hoya Grande, 1400 m., February 1947, *Williams & Molina 11982* (BH.).

Paurotis Schippii, Burret, in Notizbl. Bot. Gart. Berlin, xii, 304 (1935).

Paurotis Schippii is apparently a third species of this alliance judging from the description. Neither isotype nor matching collections have been located, hence formal combination is not made. It is obviously not a true Paurotis having as it does a thick solitary trunk and unarmed petiole. Nor does it appear to be conspecific with *E. salvadorensis*, differing in the white-ceraceous lower leaf-surface, unarmed petiole, fuscous rather than gray-tomentose rachillæ and glabrous flowers. The latter are glomerulate, hence it is not a Brahea as suggested by Burret in discussion where a provisional combination was made. Placement of this species must wait until authentic or topotypic specimens are available for study.

BRAHEA

With the exception of a new taxon described herein, the species of Brahea have been discussed previously in this journal (Gent. Herb. vi, 177–195, 1943). They fall in two rather clearly defined subdivisions as indicated by the following synopsis and key to the new species. Complete flowering and fruiting series of all species are necessary before an expanded key can be prepared.

A. Flower-buds and flowers sessile or slightly elevated on slender tomentellous rachillæ: rachillæ becoming more or less glabrous in fruit with prominent raised floral scars: leaves pliable, the segments nearly flat, green above and conspicuously waxy-glaucous below, the secondary veins scarcely distinct from the tertiary veins and not connected by cross-veinlets; petioles unarmed.

B. Arborescent: spadices more or less pendulous, at least in fruit: fruit large, 16–17 mm. long when fresh shrinking to 13–14 mm. when dry. ..... *B. calcarea, B. prominens*

BB. Acaulescent or nearly so: spadices erect from outer circle of leaves: fruit small, 7–8 mm. long or less..... *B. Moorei*

AA. Flower-buds and flowers distinctly immersed in the thickish densely tomentose rachillæ: rachillæ remaining tomentose in fruit with sometimes conspicuous but scarcely elevated floral scars: leaves stiff, the segments strongly plicate and often drooping at the tips, green above and below or sometimes glaucescent below, the secondary veins numerous, conspicuously coarser than the tertiary veins, connected by elevated cross-veinlets below; petioles denticulate to coarsely callous-dentate.

B. Petals glabrous or with rare scattered hairs; sepals prominent, glabrous with apical tuft of short hairs: ultimate rachillæ 4–8 cm. long, more or less rigid in bud and in fruit..... *B. Berlandieri, B. bella*

BB. Petals prominently canescent at base, glabrous at apex; sepals scarcely prominent, canescent: ultimate rachillæ 5–15 cm. long, more or less flexuous at anthesis and in fruit..... *B. dulcis, B. Conzattii*

† **Brahea Moorei,** L. H. Bailey, spec. nov. Fig. 90.

Planta acaulis: folia erecta, flabellata, supra atroviridia, subtus glaucescentia petiolis inermibus 37–47 segmentis linearibus ad 48 cm. longis et ad

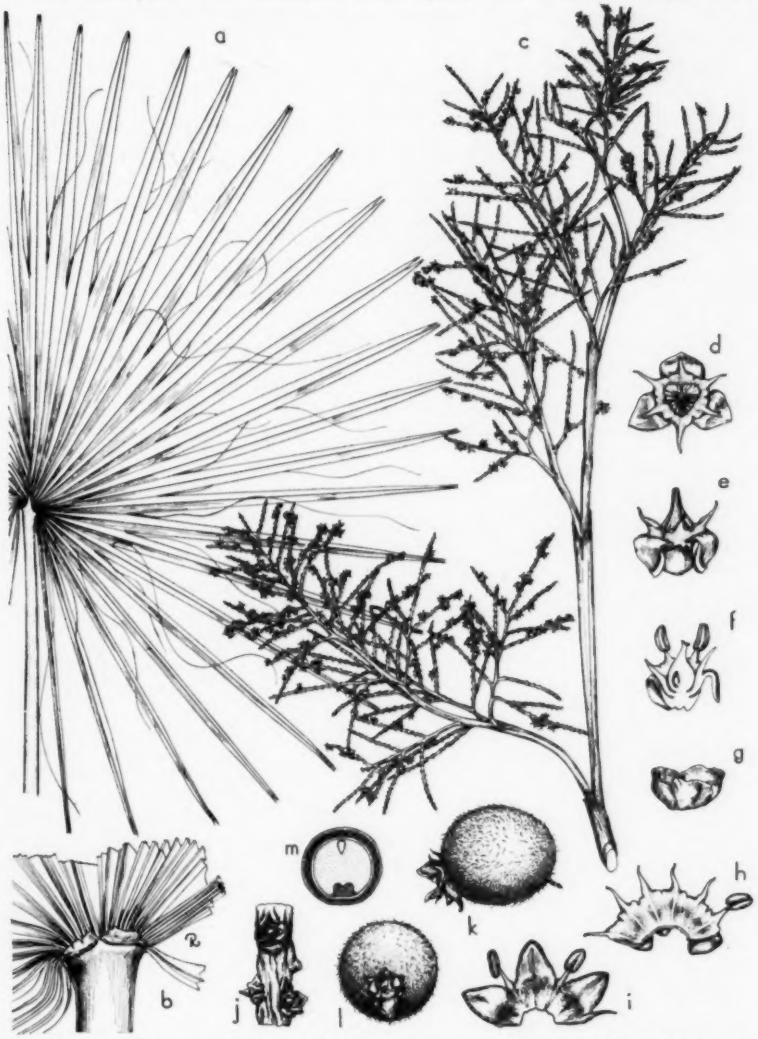
28 mm. latis nervis secundariis et tertiis similibus sine nervulis connexis: spadix erectus ad 3 m. altus 4–5 ramis biramosis; rachillæ elongatæ, tenues, leviter tomentosæ: flores sessiles sepalis 1–1.5 mm. altis puberulis petalis 3.5 mm. altis reflexis ad basin canescentibus ad apicem glabris: fructus 6–7 mm. longus ellipsoidalis vel subglobosus; semen fere globosum albumine plano leviter excavato.

Acaulescent from a thick crown or more rarely from a short trunk not more than 3 dm. high (fide Meyer & Rogers): leaves erect and spreading; petioles to 6 dm. long or more, unarmed, glaucescent, flat above, rounded below; hastula short, obliquely truncate with short truncate membranaceous ligule; blade scarcely costapalmate, rather stiffly flabellate, nearly flat, dark green above, conspicuously glaucous below, irregularly divided one-half or more to the base into 37–47 segments; segments linear, shortly to deeply bifid at the apex with filiferous margins, to 20 or more rarely 28 mm. wide at middle, to 48 cm. long, rather soft and pliable with a prominent primary nerve and numerous closely-spaced secondary and tertiary nerves, the secondaries not or scarcely distinguishable from the tertiaries and without connecting cross-veinlets: inflorescence interfoliar from outer circle of leaves, erect, 1.7–3 m. high with 4–5 or more widely spaced branches above the middle; spathes about 6 on the peduncle and 4–5 subtending primary spadix-branches, the lowermost short, laterally bicristate, the remainder tubular, closely sheathing; primary branches of spadix twice-branched, the rachillæ slender, elongate, slightly flexuous or straight, 1–1.5 mm. wide, 6–10 cm. long, whitish tomentellous in bud, becoming glabrate or glabrous in fruit: flowers 3.5 mm. high, hermaphrodite, solitary, sessile in the axil of a thick-based triangular puberulent rachilla-bract and a lateral scarious puberulent triangular floral-bract; sepals white-puberulent, free and imbricate in bud, becoming glabrescent and somewhat cupular at anthesis, 1–1.5 mm. high and broadly rounded at apex; petals lightly imbricate at base in bud, valvate above, united with filament-tube to above the calyx at anthesis, the free lobes 2 mm. long, strongly reflexed, white-canescent at base, glabrous above, not strongly veined, acutish; stamens 6, filaments broadly triangular, connate in a tube at base surrounding the gynœcium, and rather abruptly tapered to a subulate apex, anthers oblong in outline, introrse, dorsifixed and versatile, more or less sagittate at base, 1 mm. long; carpels 3, connate centrally, tapered to subulate connate styles, canescent at base: mature fruit purplish, 6–7 mm. long, puberulent or becoming glabrous, ellipsoid to nearly globose with subapical ventral stigmatic point; exocarp thin, wrinkled in drying; mesocarp thin, with few long flattish fibers and scant mealy pulp; endocarp fragile; seed nearly globose, 6–7 mm. diameter without prominent raphe, endosperm plane with lightly intruded testa below the raphe, embryo lateral.

Mexico: Hidalgo, District Jacala; La Placita, near km. 260 on highway between Zimapán and Jacala, alt. 1600–1700 m., September 8 & October 30, 1949, *H. E. Moore 5013*, type (immature and mature fruit from same spadix); same locality, April 26, 1947 *Moore 2639* (in flower) and July 11, 1948, *Moore & Wood 3891* (immature fruit); upper level of Barranca de Tepetates between Jacala and Tepetates, September 21, 1949, *Moore*

5038 (in young bud) (all BH.): Tamaulipas; Dulces Nombres, alt. 1850 m., June 18, 1948, *F. G. Meyer & D. J. Rogers no. 2553* (BH., MO.).

An infrequent but handsome small palm with much the aspect of



90. BRAHEA MOOREI. a, leaf ×1/6; b, hastula ×1; c, terminus of spadix ×1/3; d, e, f, flower face, side, section ×3; g, calyx ×4; h, i, corolla expanded, inner and outer view ×3; j, fruiting rachilla ×5; k, l, fruit ×2; m, fruit cross-section ×2.

Sabal minor for which it was at first mistaken. In the district of Jacala it inhabits more or less shaded limestone outcrops in oak or oak and cedar woods and is seldom found in full sun. One sterile but especially luxuriant plant was seen growing in the depths of a lime sinkhole in the region of Puerto de la Zorra between Jacala and Tierra Colorada. In the Barranca de Tepetates it grows with an arborescent Brahea related to if not identical with *B. Berlandieri* but is readily distinguished, even in the sterile state, by the stiffly flabellate leaves with dark green upper surface, conspicuously glaucous lower surface and fine nervature.

ARTICLE 6.
VARIOUS NEW PALMS.

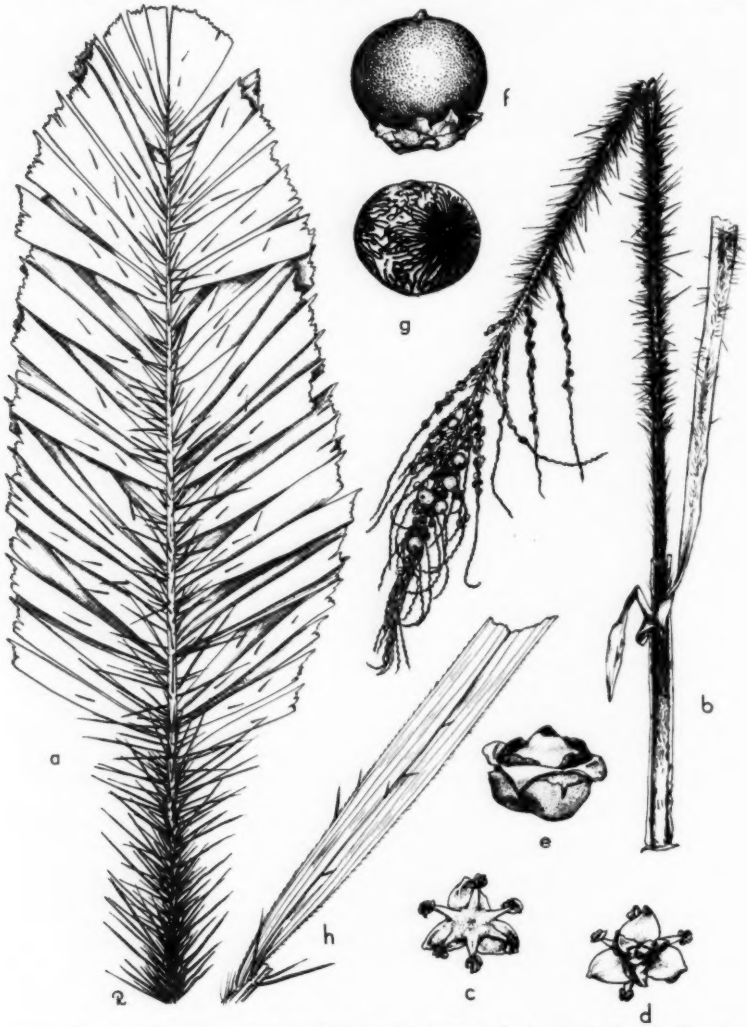
During the past two years several collections of palms, mostly from the new world, have been studied. In 1946, Mr. and Mrs. M. B. Foster collected many interesting numbers during a stay in Colombia. Their material of Aiphanes has proved of especial interest and three novelties are described here. The rewarding efforts of Mr. Paul Allen and Dr. R. E. Schultes provide further additions to the palm flora and one species is described from cultivation.

† **Aiphanes concinna,** spec. nov. Subgen. Brachyanthera. Fig. 91.

Coloniata; caules spinosi, ad 5 m. alti, 5–7.5 cm. lati: folia 75 cm. longa vel ultra, concinna, vaginis petiolis brevibus et rachibus dense spinis ad 9.5 cm. longis armatis; pinnæ utrinque 32–33 per greges 2–4 dispositæ, anguste cuneatæ, uninervatæ apicalibus 2–4–nervatis exceptis, 10–23 cm. longæ, 2–3.5 cm. latæ, subtus hispidæ venis setosis spinosisque et marginibus ciliatis: spadix simpliciter ramosus; spathæ duæ, exterior 37 cm. longa tomentosa et dense aculeata, interior longior, tenuis, tomentosa et modice spinosa spinis ad 2.5 cm. longis; pedunculus 85 cm. longus, tomentosus et dense spinis brunneis ad 5.5 cm. longis armatus; rachis ca. 35 cm. longa, tomentosa, sparse armata; rachillæ 40–50 vel plures, ad 23 cm. longæ; flores masculi 2.5 mm. alti et lati, sepalis deltoideis ad basin non incrassatis, petalis ovatis, antheris ovoideis; flores feminei jam fecundati, sepalis et petalis 6 mm. altis, cupula staminodiorum truncata, ovario glabro: fructus subglobosus 13–15 mm. diam., breviter rostratus; endocarpium globosum 11–13 mm. diam. læve haud foveatum foraminibus vix super medium insertis fibris applanatis tectis.

Colonial; stems to 5 m. high, 5–7.5 cm. wide, ringed with spines: leaves 75 cm. long or more; sheath and short petiole tawny-tomentose, densely armed with short aculeæ and ascending often pale-based spines to 9.5 cm. long; petiole ca. 5 cm. long; rachis ca. 66 cm. long, bifacial, moderately setose and spinose above, rounded, deciduous pale-furfuraceous, black-setose and densely spinose below with flat black spines 1.5–9.5 cm. long; pinnæ 32–33 on each side in groups of (1)–2–4 at intervals of 3–5 cm., probably borne in two planes, 1–nerved except the 2–4–nerved apical pair, the lower to 23 cm. long, 2 cm. wide, the median 17 x 3 cm. the upper ca. 10 x 2.5–3.5 cm. the terminal to 10.5 x 5.5 cm., hispid and setose above and below, the mid-vein yellow, prominent and sometimes armed above, pale deciduous-tomentose and sparsely spinose below, the secondary veins prominent below, margins setose: spadix ca. 1.2 m. long, simply branched; spathes 2, the outer 37 cm. long, ca. 2 cm. wide, ancipitous, tawny-tomentose, more or less densely armed on back with brown aculeæ 1–2 cm. long, the inner incomplete, that portion seen 60 cm. long, ca. 2 cm. wide, thin, tawny-tomentose and moderately spinose with spines to 2.5 cm. long; peduncle 85 cm. long, tawny-tomentose and densely spinose

with brown spines to 5.5 cm. long; rachis ca. 35 cm. long, tomentose, sparsely armed with crimped brown spines; rachillæ 40–50 or more, the lower to 23 cm. long, 3 mm. thick, sparsely spinose at base with glomerules of one pistillate and two staminate flowers for about half their length,



91. AIPHANES CONCINNA. a, leaf ×1/6; b, spadix, ×1/6; c, d, staminate flowers, face and back ×3; e, pistillate flower in young fruit ×2; f, fruit ×1½; g, endocarp, ×1½; h, pinna ×1/3.

staminate above, the upper to 8 cm. long and primarily staminate: staminate flowers (recovered from cobwebs on leaf) 2.5 mm. high x 2.5 mm. wide; sepals ca. 1.5 mm. long, more or less deltoid, acute, not produced nor thickened at base; petals 3 mm. long, 2 mm. wide, ovate; stamens 6, shorter than petals, filaments united in a broad ring at base, anthers ovoid, ca. 0.8 mm. long, pistillode a minute central protuberance: pistillate flowers all fertilized and in young fruit; sepals nearly reniform, ca. 6 mm. wide x 4 mm. high, irregularly crenate, hyaline-margined; petals ca. 6 x 6 mm., brown-margined, the perianth becoming cupular in fruit; staminodial cupule irregularly truncate; ovary glabrous: immature fruit blue-red, subglobose, 13–15 cm. long x 13–15 cm. wide, smooth when fresh drying roughened, abruptly short-rostrate; exocarp thin; mesocarp thin, pulpy with few flat fibers; endocarp globose, 11–13 mm. diameter, brown, grooved but scarcely pitted between the pores, the pores slightly above the middle with numerous appressed radiating flat dark fibers; seed not formed.

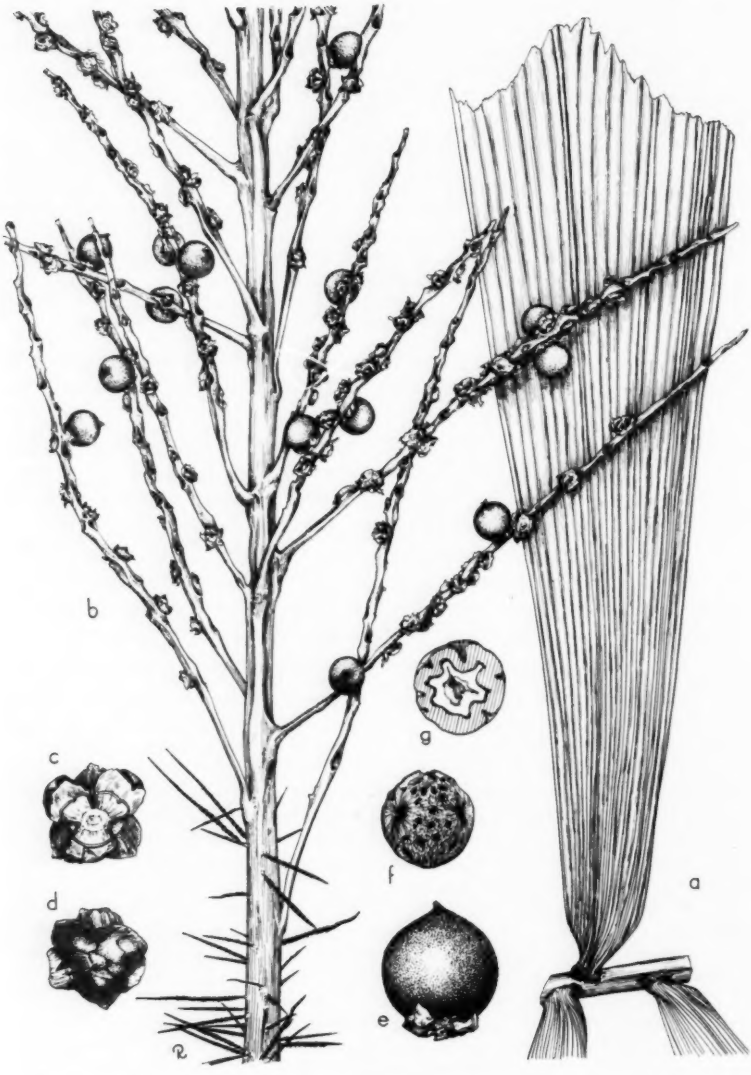
Colombia: Province Cundinamarca; in former dense forests near Fusagasaga, alt. 9000 feet, October 12, 1946, *M. B. & R. Foster 1870* (BH. type, A. isotype).

The small crowded pinnæ of this species are probably borne in two planes along the rachis and in their several characters are distinctive. Comparison of the leaf illustrated here from a flattened specimen with the crude illustration of *Martinezia disticha*, Linden, in Gartenflora, xxviii, t. 977 (1879) shows a certain resemblance. The latter, however, must be considered a nomen confusum for the illustration is so crude as to be unplaceable and no description is provided. In its scarcely pitted endocarp, *Aiphanes concinna* differs from most species for which fruit is known.

† **Aiphanes Fosteriorum,** spec. nov. Subgen. Brachyanthera. Fig. 92.

Coloniata; caules ad 10 m. alti, 10 cm. lati, horride armati: folium completum non visum; rachis inermis minute hirsuta; pinnæ alternæ, cuneatæ ad 45 cm. longæ apicibus 13–14 cm. latis eroso-lobulatis et 1–2 cm. productis, supra nitidæ, glabræ, subtus plus minusve dense hirsutæ et aculeatæ, ca. 23-venosæ: spadix simpliciter ramosus, robustus, ca. 3 m. longus; spathæ ignotæ; pedunculus tomentosus, setulosus et spinosus spinis tomentosis ad 6 cm. longis; rachis inermis; rachillæ ad 30 cm. longæ vel ultra, 3–6 mm. latæ, hispidulosæ; flores masculi ignoti: flores feminei in rachillam immersi, perianthio sub fructu accrescenti ca. 6 mm. alto, cupula staminodiorum irregulariter lobata, 2.5 mm. alta: fructus ruber, globosus, rostratus, 16–17 mm. diam.; endocarpium 14–15 mm. diam., globosum, foveatum, foraminibus vix super medium insertis fibris tenuibus tectis.

Colonial; stems to 10 m. high, 10 cm. thick with very long spines: leaves incompletely known; sheath fuscous-furfuraceous, densely brown-hispid and armed with stout, flattish, pale-based deciduous-tomentose spines 1–5.5 cm. long; petiole not seen; rachis unarmed, hispidulous becoming glabrous; pinnæ alternate on the leaf fragment seen, broadly cuneate, to 45 cm. long, 13–14 cm. broad at the erose-lobulate apex, longest along the midvein, the upper margin produced 1–2 cm., glossy and



92. AIPHANES FOSTERIORUM. a, pinna ×⅓; b, spadix portion ×⅓; c, d, pistillate perianth in fruit, face and back ×1½; e, fruit ×1; f, g, endocarp, side and cross-section ×1.

glabrous above, paler and more or less densely brown-hirsute below, ca. 23–veined, the veins about equal, impressed above, prominent, and minutely aculeate below: spadix simply branched, robust, ca. 3 m. long (fide collectors); spathes unknown; peduncle 1.5 cm. diameter, deciduous-tomentose, hispidulous, and moderately armed with stout flat deciduous-tomentose black spines to 6 cm. long; rachis similar but unarmed above base and densely hispidulous toward apex; rachillæ numerous, stout, ca. 6 mm. wide at insertion, 3–4 mm. diam. above, to 30 cm. long or more, densely setulose; staminate flowers unknown; pistillate fls. more or less deeply immersed in rachis, the perianth accrescent in fruit, petals 6 mm. high, acute, deltoid, slightly exceeding the sepals, united basally, staminodial ring ca. 2.5 mm. high, irregularly lobed: fruit rose-red at maturity, globose, rostrate, 16–17 mm. diameter; exocarp thin, smooth, drying roughened; mesocarp thin with few fibers; endocarp globose, chocolate-brown, 14–15 mm. in diameter, 2–4 mm. thick, deeply pitted, pores at middle with slender radiating fibers; seed irregular, albumen plane.

Colombia: Province Nariño; Altaquer, alt. 3500 feet, November 10, 1946, *M. B. & R. Foster 2117* (BH. type, A. isotype).

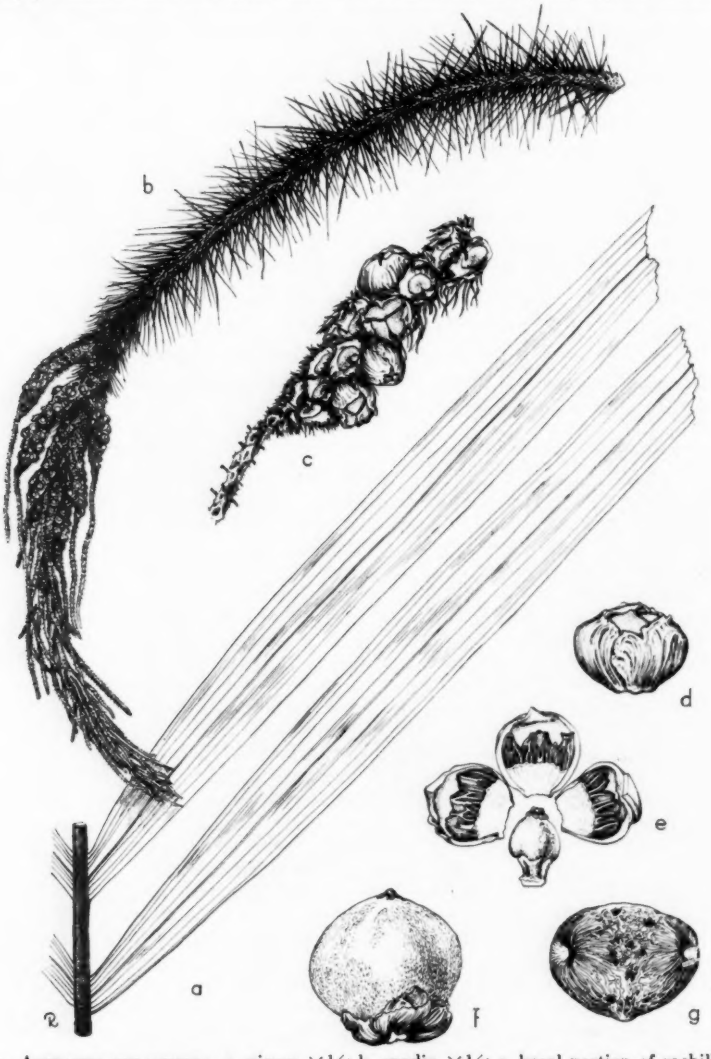
The relationship of this species is not readily determined but in the large size, large pilose pinnæ and unusual spadix with pubescent spines it is distinct from any species heretofore described.

† **Aiphanes gelatinosa,** spec. nov. Subgen. Brachyanthera. Fig. 93.

Coloniata; caules armati, alti et graciles: folia regulariter pinnata; rachis inermis; pinnæ oppositæ utrinque 15 vel plures uninervatæ terminalibus latioribus exceptis fere lineares, 50–60 cm. longæ, 3.5–5.5 cm. latæ, supra glabræ, subtus dense minuteque albo-granulatæ nervo medio et margine dense breviterque aculeati: spadix pendulosus, simpliciter ramosus; pedunculus ca. 1 m. longus, dense fusco-villosus et spinis ad 9 cm. longis armatus; rachillæ ca. 30 infimis applanatis et subfasciatis ad 25 cm. longis, 1.5 cm. latis, infra flores masculi et feminei glomerati supra flores masculi gerentibus, supremis tenuibus principaliter staminatis; flores masculi delapsi; flores feminei densi profunde immersi sepalis et petalis subæqualibus 6–7 mm. altis; cupula staminodiorum urceolata, truncata: fructus depresso-globosus, 16 mm. diam. 14 mm. altus; endocarpium foveolatum foraminibus vix super medium insertis fibris tenuibus tectis.

Colonial; stems tall and slender, ringed with continuous 45° spiral of spines that point downward: leaves regularly pinnate, the rachis unarmed, hirsutulous or glabrate; pinnæ opposite, 3–4 cm. apart, 15 or more on each side, the terminal broad, several-nerved, remainder 1–nerved with numerous secondary nerves, nearly linear in outline, 50–60 or more cm. long, 3.5–5.5 cm. wide, obliquely truncate, erose-dentate and scarcely produced at apex, glabrous above, densely and minutely white granulate below, the prominent midnerve and upper margin densely short aculeate below, secondary nerves ca. 10 to a side, glabrous or sparsely aculeate: spadix pendulous, simply branched; spathes unknown; peduncle ca. 1 m. long, 1.5 cm. thick, densely fuscous-villous and armed with crimped, angled, deciduous-villous shining brown spines to 9 cm. long; rachis 25 cm. long, densely pilose and aculeate; rachillæ ca. 30, the lower 10–12 applanate and subfasciate, densely pilose and aculeate at base, to 25 cm. long, 1.5

cm. thick with glomerules of one pistillate and two staminate flowers for half their length and staminate above, the upper 18–20 primarily staminate with few or no pistillate fls.: staminate flowers lacking: pistillate fls. deeply sunken and crowded with 1–2 staminate acolytes; sepals 6 mm.

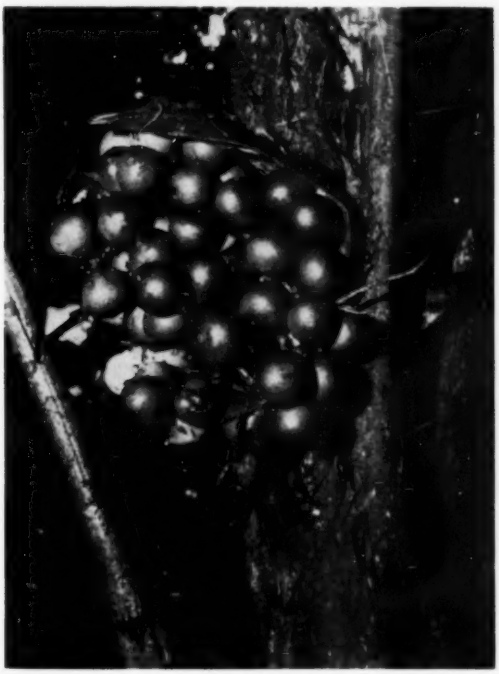


93. Aiphanes gelatinosa. a, pinnæ ×¼; b, spadix ×⅛; c, basal portion of rachilla ×1; d, e, pistillate flower, side and expanded ×2; f, fruit ×1½; g, endocarp ×1½.

high; petals 7 mm. high, incurved and thickened at apex; staminodial cupule urceolate, truncate, obscurely separated from petals: fruit depressed-globose and short-rostrate, brown and green, ca. 17 mm. diameter, 15 mm. high; exocarp smooth drying roughened; mesocarp thin with few fibers; endocarp depressed-globose, 16 mm. wide, 14 mm. high, pale brown, prominently pitted, pores about median with flat pale radiating fibers.

Colombia: Nariño; beyond Junin, alt. 2000 ft., November 14, 1946, *M. B. & R. Foster 2164* (BH. type; A. isotype).

Aiphanes gelatinosa appears to be related to *A. echinocarpa*, Dugand in its long narrow pinnæ and thick lower rachillæ but is distinct in the glabrous fruit, longer and broader pinnæ, and aculeate more densely pubescent rachillæ. *A. linearis*, Burret and *A. Kalbreyeri*, Burret, also similar in shape of the pinnæ, are distinct in having aculeate or setose fruit and *A. Lindeniana*, Wendl. differs in having smaller and 4–6-grouped pinnæ along an armed rachis. *A. Schultzeana*, Burret of Ecuador has the same type of spadix but has short deltoid-cuneate pinnæ and the calyx only one-half as long as the corolla.



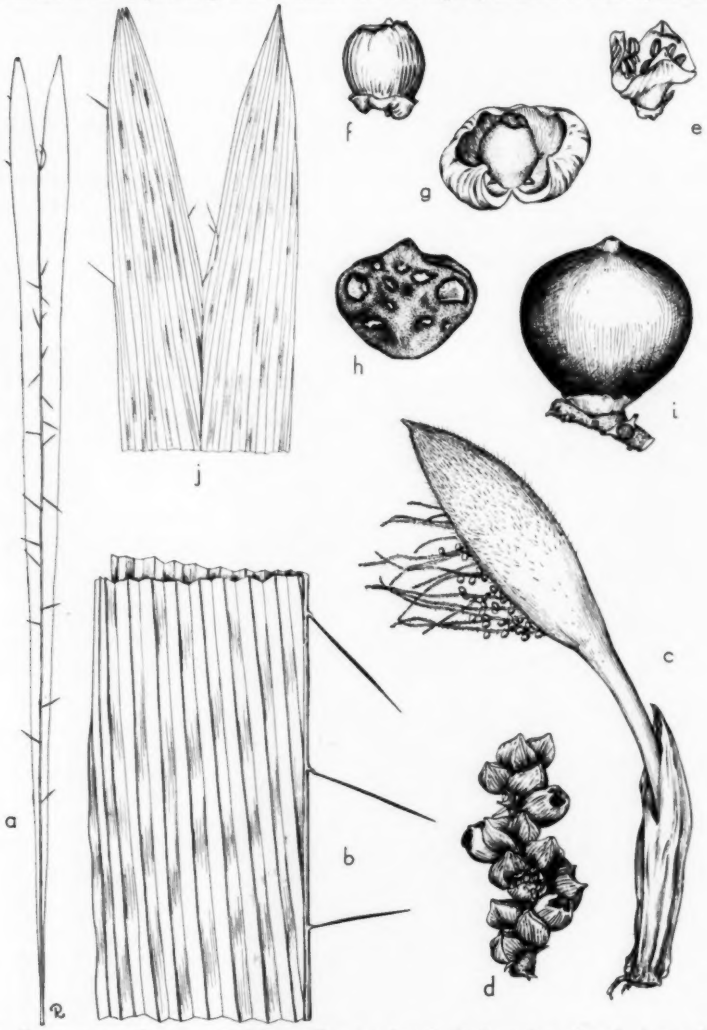
94. BACTRIS MILITARIS, fruiting spadix. Photograph by Paul Allen.

According to the collectors, *A. gelatinosa* has the flowers and fruit encased in jelly. Dried gelatinous masses are to be found in the flowers but the exact nature of the secretion has not been determined.

† **Bactris militaris,** spec. nov. Subgen. Eubactris. Figs. 88, 94, 95.

Coloniata; caules 5–20 ad 5 m. alti: folia 6–8 erecta cuneato-oblanceolata, integra, ad 3.1 m. longa, 25.5 cm. lata rachibus armatis: spadix ad 48.5 cm. longus; spathæ duæ, exteriore inermi interiore aculeis ad 4 mm. longis armata; flores masculi 4 mm. longi, staminibus 6; flores feminei 4 mm. longi staminodia carentes: fructus turbinatus, 15–17 mm. altus.

Stoloniferous in clumps of 5–20 canes averaging 3–5 m. high and 4 cm. in diameter: leaves 6–8, erect; petiole unarmed (where seen), rounded, fulvous-lepidote-tomentose; rachis 2.8 m. long, fulvous-lepidote-tomentose, rounded below, prolonged in a short awn at apex, unarmed above, armed



95. Bactris militaris. a, leaf in outline ×1/21; b, leaf section, dorsal view ×⅓; c, spadix ×⅓; d, portion of rachilla ×2; e, staminate flower ×4; f, g, pistillate flower, side and expanded ×4; h, endocarp ×1½; i, fruit ×1½; j, tip of leaf ×1/9.

below with stout, rounded or two-sided pale-based black spines 4.5–8.5 cm. long; blade glabrous, green above, darker and semi-iridescent below when dry, 3.1 m. long, 25.5 cm. wide at apex of rachis, elongate cuneate-oblanceolate in outline, entire, very gradually expanded from a narrowly cuneate base to the bifid apex, the apex 40 cm. long on inner margin; margins entire, sparsely armed toward apex with few short, round, pale-based black spines to 3.5 cm. long; primary nerves about 20 on each side at an angle of about 15° with the rachis: spadices 30–48.5 cm. long; spathes 2, the outer ancipitous, 13–19 cm. long, 2–2.5 cm. wide, fulvous-tomentose becoming glabrate in age, unarmed, the inner long-peduncled, the manubrium 14–24 cm. long, the cucullus 16–25 cm. long, densely fulvous-tomentose, sparsely armed with slender pale-based brown spines to 4 mm. long; rachillæ 14–23, 15–6 cm. long, the rachis to 10 cm. long: staminate flowers 4 mm. long, greenish, asymmetric, irregularly dispersed on the lower half of the rachilla, crowded toward the apex, shortly pedicellate, the pedicels bracteolate; calyx to 1 mm. high, three-lobed the lobes acute; petals united below about a fleshy torus, the free lobes irregularly deltoid; stamens 6, filaments subulate, inflexed at apex in bud, anthers elliptic, ca. 0.75 mm. long; pistillode lacking: pistillate flowers greenish, ovoid, to 4 mm. long, irregularly disposed on lower half of rachilla; calyx ca. 1 mm. high, obscurely 3-lobed, undulate when dry; corolla to 4 mm. high, urceolate at anthesis, loosely cupular and irregularly crenate in fruit; staminodia 6, minute; ovary short-stipitate, ovoid, stigma broad, dark, irregularly rounded, sessile: fruit red at maturity, glabrous, turbinate and mammillate-umbonate (in siccu), 15–17 mm. high, 15–17 mm. diameter; exocarp thin, closely fibrous and finely striate in siccu; mesocarp thin, somewhat fibrous and adherent to endocarp; endocarp blackish, ca. 13 mm. diameter, 1 mm. thick, turbinate, bearing broad deep pores at or slightly above the middle; seed depressed, embryo lateral.

Costa Rica: Provincia de Puntarenas, Canton de Osa, vicinity of Jalaca farm, Golfo Dulce Area, very common near Tinoco station on the Palmar-Golfito R.R. in heavy forest but not seen elsewhere, alt. 100 feet, April 30, 1949, *Paul Allen 5276* (BH. type, US. isotype); forest between Rio Esquinas and Palmar, vicinity Tinoco station, July 13, 1951, *Allen 6264* (BH.); lowland forest near Tinoco station, August 28, 1951, *Allen 6296* (BH.).

Among the North American species of Bactris, *B. militaris* is perhaps closest to *B. Wendlandiana* in its simple leaf and much-branched spadix. It differs from that species and all others having simple leaves in the great length of the blade that is generally held in an erect position. A clump of plants brings to mind a group of soldiers. The leaf resembles that of *B. bifida*, Mart. in some respects but the latter has a simple spadix. It may also be compared to *B. Cuesco*, Engel of Venezuela, which has smaller leaves, prominently rostrate fruit and strongly aculeate inner spathe.

This unusual palm is described complete with flowers and fruit thanks

to the efforts of that keen collector Paul Allen who made additional trips to the type locality to secure fruit and photographs.

† **Chamædorea erumpens,** spec. nov. § Chamædoropsis. Figs. 96, 97.

Coloniata; caules numerosi, ad 3 m. alti: folia ca. 4, regulariter pinnata, glabra; pinnæ lanceolatæ, ad 27.5 cm. longæ, 30 mm. latæ vel apicalæ ad 9 cm. latæ, uninervatæ apicalibus exceptis, cum utrinque 14–15 tum apicales 2–3-nervatæ cumve utrinque 5–6 tum apicales 7–9-nervatæ: spadices interfoliata vaginam erumpentes vel demum infrafoliati; spathæ 5 pedunculum 4.5–8.5 cm. longum æquantes vel excedentes; 6–11 rachillæ 7.5–15 cm. longæ; flores masculi 1–1.2 mm. alti, petalis liberis, pistillodiis columnaribus; flores feminei 3 mm. alti, petalis acutis, staminodiis 6 squamiformibus: fructus 8 mm. diam., niger; semen globosum 6 mm. diam.

Soboliferous; stems to 40 in a clump, to 3 m. high or more, 11–17 mm. diameter, internodes 21.5–6.5 cm. long: live leaves about 4, regularly pinnate, glabrous; sheath 16.5–20 cm. long, striate; petiole 4.5–7 cm. long, convex below, canaliculate above; rachis 42–47.5 cm. long, convex below, bifacial above; pinnæ 14–15 on each side, the terminal 2–3-nerved, the remainder 1-nerved with a pair of prominent secondary and numerous closely spaced fine tertiary nerves on either side, or 5–6 with the terminal pair 7–9-nerved, lanceolate, gradually tapered to a subfalcate shortly acuminate apex or the upper merely acute, not decurrent at base, green, concolorous, thin, the basal 7–18 mm. wide, to 20 cm. long, the median 25–30 mm. wide, to 27.5 cm. long, the subapical 15 mm. wide, 15 cm. long, the apical 2.5–3 or to 9 cm. wide, 11–15 cm. long: staminate spadix interfoliar, erumpent at base of sheath, green; peduncle 4–5.5 cm. long; spathes 5, closely sheathing, the lower short, the fourth often nearly equalling the rachis and concealing the incomplete fifth; rachis 2–4.5 cm. long; rachillæ 6–11, simple or the lower rarely once or twice furcate, 7.5–15 cm. long, 2 mm. diameter (in vivo): flowers yellow, somewhat sunken in a lax more or less tristichous spiral; sepals very shortly connate at base, imbricate above, 1–1.2 mm. high, thickened basally; petals shortly connate at base, valvate above, thickish, not coherent at apex, 3 mm. high (in vivo), the apex incurved and more or less flattened; stamens 6, about three-fourths as high as petals, filaments connate at base but not forming a stipe, free above, abruptly narrowed from a broad base, anthers brownish (in vivo), introrse, dorsifixed at the middle, the locules separate above; pistillode columnar, 3-lobed at apex, slightly shorter than petals, the apex prominently visible at anthesis: pistillate spadices green at anthesis, orange in fruit, mostly infrafoliar, to 7 in flower or fruit at once; peduncle 5.5–8.5 cm. long; spathes 5, similar to those of the staminate spadix; rachis 1–2.3 cm. long; rachillæ 4–6, all simple, 9–10.5 cm. long, 3 mm. diameter (in vivo), becoming thickened in fruit, grooved below each alveolus: flowers yellow, somewhat sunken in a lax more or less tetrastichous spiral; sepals imbricate, 1–2 mm. high, to 1 mm. thick at the gibbous base, drying yellow; petals imbricate, ovate, acutish, 3 mm. high, drying brown; staminodia 6, minute and scale-like, generally bilobed; ovary subglobose, ca. 1.2 mm. high, stigmas sessile, erect or slightly recurved, papillate, ovules attached near apex of cavity: fruit globose, 8 mm. diameter, black; exocarp thin, finely reticulate; mesocarp thin, yellow,

pulpy with few slender fibers attached to the crustaceous thin endocarp; seed globose, 6 mm. diameter, testa brown, smooth, without prominent raphe; albumen plane, embryo lateral.

Cultivated at Fairchild Tropical Garden, Coconut Grove, Florida, said to be from seeds obtained in British Honduras by W. A. Schipp. March 28, 1951, *Moore 5830* (staminate, type) and *5829* (pistillate).

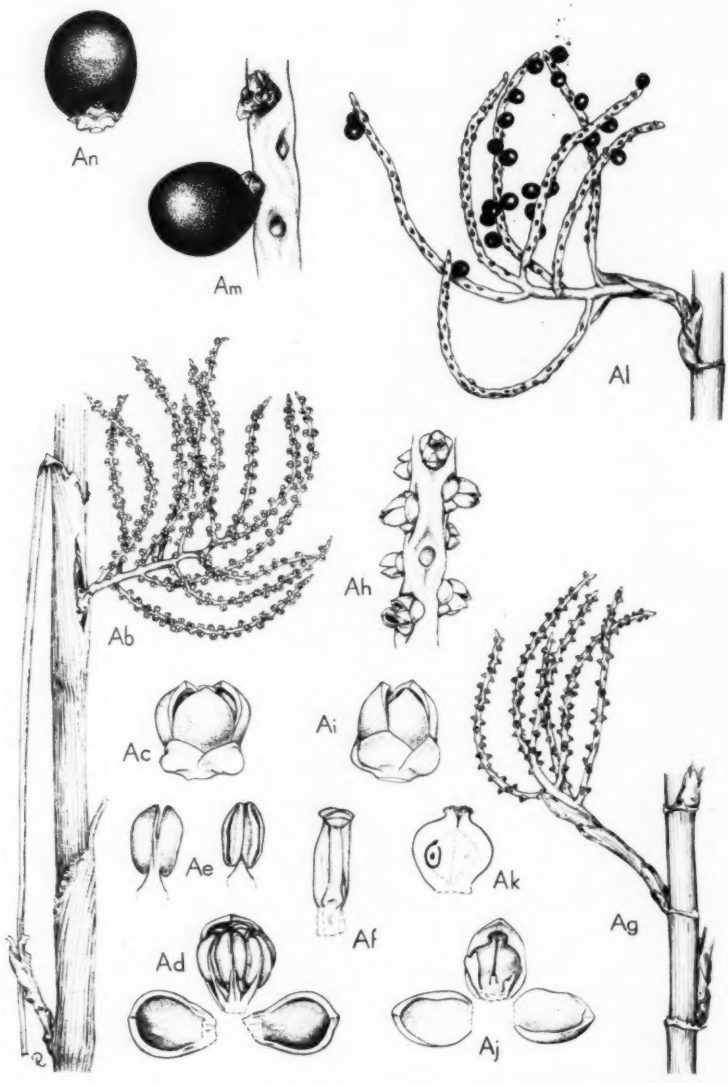
Hv. **'Fairchild'** differs from the material considered typical of the species in having the pinnæ 5–6 to a side on a slightly foreshortened rachis, the apical pair 7–9-nerved and as much as 9 cm. wide.

Cultivated at Fairchild Tropical Garden, with the typical phase, *Moore 5832* (staminate, type) and *5831* (pistillate).

This attractive colonial palm has entered cultivation in the United States in recent years and Mr. Harry Dunaway, Superintendent of the Fairchild Tropical Garden, states that it is much used as an indoor plant for club and restaurant decoration in Florida where it has gone by several names, among them *Chamædorea Schippii* and *C. elegans*. The name given here refers to the manner in which the very short spadices of at least the staminate plants burst through the leaf-sheath but might equally refer to the manner in which it has suddenly come into prominence as a cultivated palm.

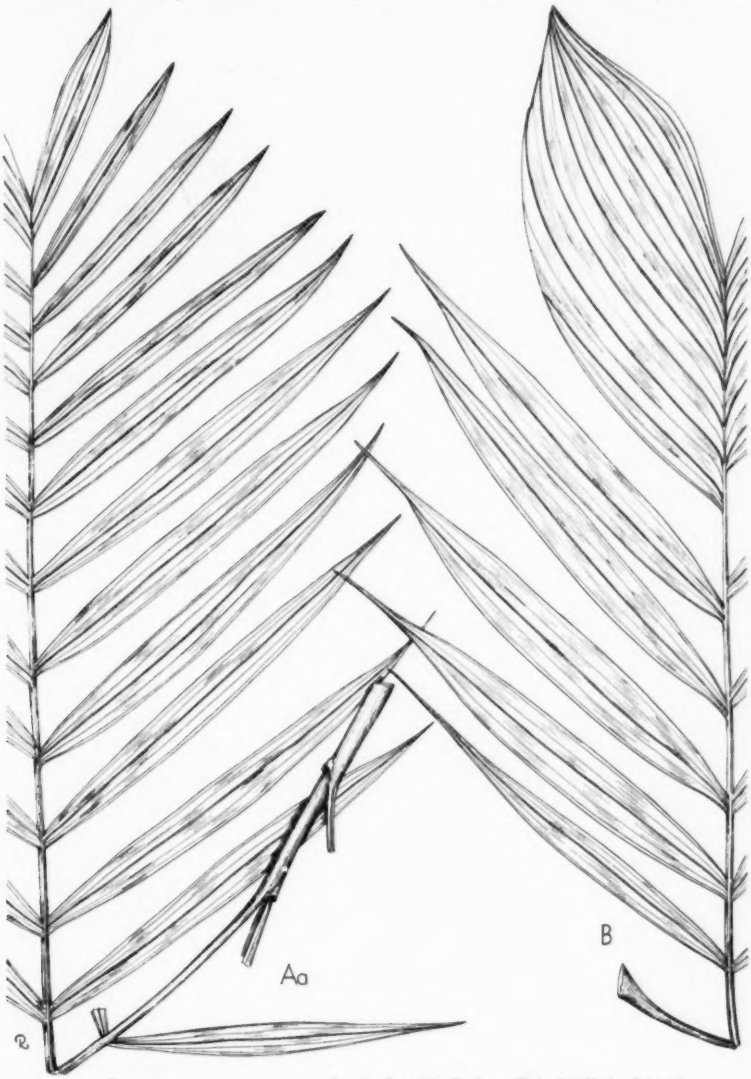
Two leaf facies occur in the species. That with the pinnæ regularly arranged has been arbitrarily selected as typical. The other, with the terminal pinnæ united, is designated above as a hortvar. honoring Dr. David Fairchild. Both types are growing together, presumably having come from the same lot of seed, and examination of living and herbarium material discloses no difference other than that found in the foliage. Such variation is not uncommon in the wild, having been observed by the writer in *Chamædorea microspadix*, Burret and *C. Pringlei*, Wats. Herbarium specimens of other species show similar tendencies at times. Although I cannot separate the two phases on a biological basis it seems advisable to designate the broad-tipped form in some manner since it is in cultivation and will undoubtedly be the recipient of one or more names if its relationship to the more usual form is not indicated. For that reason it is described as a hortvar. following recommendations of the Stockholm Congress in 1950. As both staminate and pistillate plants bear the same type of foliage and come from wild stock, it is apparent that more than a clonal selection is under consideration and the form may breed true from seed. Further study of variation in this species will be of interest.

Chamædorea erumpens is one of two or perhaps three allied species having pinnate leaves and very short spadices with the rachillæ equalling or exceeding the peduncle. In many instances the spadix of these species, particularly in the staminate plants, bursts through the base of the leaf-sheath, becoming infrafoliar later by loss of the old sheath. There is great



96. CHAMÆDOREA ERUMPENS. Ab, staminate spadix ×⅓; Ac, Ad, staminate flower, side and expanded ×5; Ae, stamens ×7; Af, pistillode ×7; Ag, pistillate spadix ×⅓; Ah, portion of pistillate rachilla ×2; Ai, Aj, pistillate flower, side and expanded ×5; Ak, ovary in section ×7; Al, fruiting spadix ×⅓; Am, An, fruit ×2.

similarity in floral morphology where this has been investigated. The species here described differs from its allies principally in the shape and nervation of the pinnæ, these being lanceolate rather than linear, at least



97. CHAMÆDOREA ERUMPENS. Aa, leaf ×⅛; B, hv. 'Fairchild', leaf ×⅛.

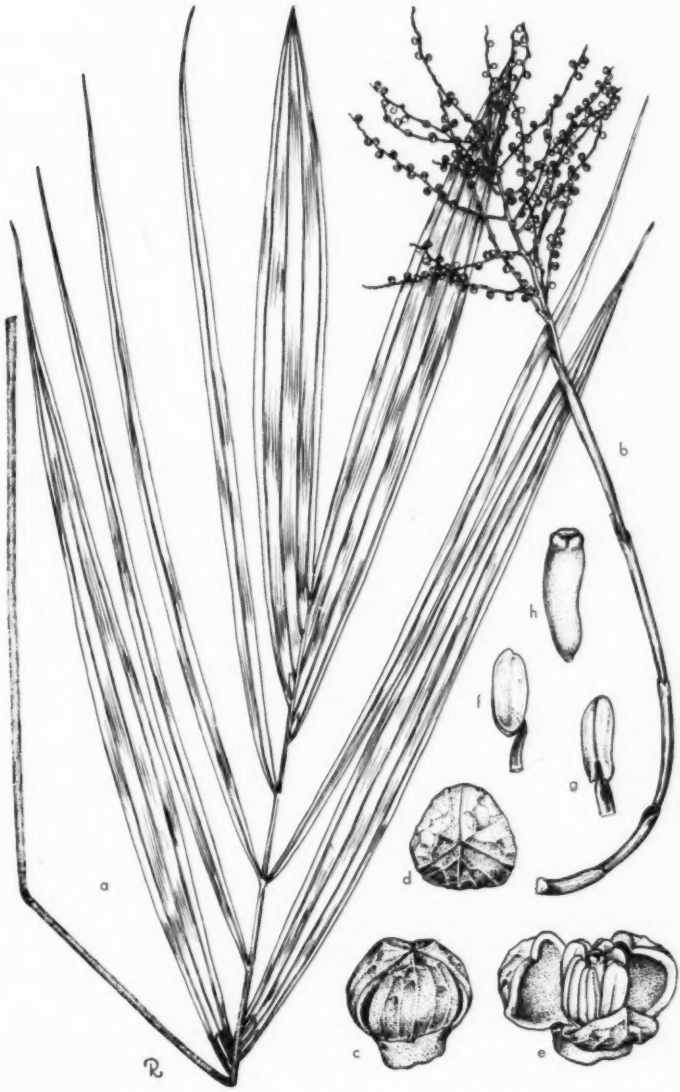
twice as broad as those of the others with a prominent pair of secondary nerves on either side of the primary or midnerve and numerous fine closely set tertiary nerves. *Chamædorea Seifrizii*, Burret is the only species previously described having close relationship but it differs in the linear pinnæ, 10 mm. broad or less and in habit, having been noted as a scrambling palm. Perhaps this last may prove the same as that discussed in detail by O. F. Cook under the illegitimate name of *Meiola campechana* (Nat. Hort. Mag. xxii, 138–139, 1943). What may be a third species is represented in the Bailey Hortorium by cultivated specimens from Cuba. Until more adequate or authentic material is available for comparison, a complete study of this small group cannot be accomplished.

Relationship with other species of the section Chamædoropsis is not easy to determine. The foliage bears considerable resemblance to that of *Chamædorea Karwinskyana* and others but all these have long-pedunculate spadices that emerge through the apex of the leaf-sheath.

† **Chamædorea ferruginea,** spec. nov. § Chamædoropsis. Fig. 98.

Caulis ad 4 m. altus: folia pinnata; petiolus elongatus, tenuis, dense ferrugineo-lepidotus; rachis 16–19 cm. longus, punctatus et sparse lepidotus; pinnæ utrinque 3–6, supra atrovirides, subtus pallidiores, lineares vel lineari-lanceolatæ, basales 3–4-nervatæ, fenestratæ, 28 cm. longæ, 1.5–1.8 cm. latæ, intermediæ 1-nervatæ, ad 31 cm. longæ, ad 5.5–7 mm. latæ, apicales 3–5-nervatæ, 20 cm. longæ, 1.7–2.2 cm. latæ: spadix masculus simpliciter ramosus, longe pedunculatus; spathæ 6, tubulares, quinta quam sextam incompletam longior; rachillæ 20, erectæ vel patentes, 8.5–3.8 cm. longis; flores sessiles, globosi, calici tridentato, 0.5 mm. alto, petalis 2.5 mm. altis, valde nervatis, ad apicem connatis basin versus liberis, staminibus 6 petalis brevioribus, pistillodio columnari: spadix femineus ignotus.

Stems to 4 m. high: leaves pinnate, with 9–11 nerves on either side; petiole slender, elongate, 40 cm. long or more, 3 mm. thick, sulcate when dry, greenish and densely ferrugineous-lepidote; rachis 16–19 cm. long, triquetrous, green, dark punctate and sparsely lepidote; pinnæ glabrous, dark green above, slightly paler beneath, with the nerves pale and prominent, linear to linear-lanceolate, not decurrent, 3–6 on either side of the rachis, the basal pair 3–4-nerved, fenestrate at rachis, acuminate at apex, to 28 cm. long, 1.5–1.8 cm. wide, the 1–4 intermediate 1-nerved, to 31 cm. long, 5.5–7 mm. wide, the apical 3–5-nerved, more or less fenestrate at rachis, to 20 cm. long on inner margin, 1.7–2.2 cm. wide, 6.5–9 cm. along the rachis: staminate spadix simply branched; peduncle 21 cm. long; spathes 6, tubular, striate, brown, bifid at apex, the first 1.8 cm. long, the fifth nearly equalling the peduncle, exceeding the incomplete sixth; rachillæ 20, erect or spreading, 8.5–3.8 cm. long, 0.5–1 mm. wide: flowers sessile, globose, 2.5 mm. high; calyx, 3-lobed, 0.5 mm. high, petals 2.5 mm. long, brown, prominently nerved and more or less reticulate when dry, coherent at the apex with tip of the pistillode, free toward the base; stamens 6, shorter than the petals, filaments very short, anther-sacs united



98. CHAMÆDOREA FERRUGINEA. a, leaf ×½; b, spadix ×½; c, d, e, staminate flower, side, top, expanded ×8; f, g, stamen ×10; h, pistillode ×12.

to the apex, pistillode columnar, indistinctly 3-lobed with a prominent depression at the apex: pistillate spadix unknown.

Mexico: Northeastern Oaxaca; District Choapam, in deep forest, Latani, lat. 12° 24′, long. 95° 48′, alt. 950 m., May 13, 1939, *R. E. Schultes 905* (BH.).

Chamædorea ferruginea is apparently closely related to *C. lepidota*, Wendl. The staminate spadix and flowers are very similar in their structure but the few very narrow elongate pinnæ and ferrugineous-tomentose petioles are strikingly different from this or other allied species.

According to the collector this species is known to the local inhabitants by the Zapotec name "ya-bo-ga-dau" or "ye-dza." The fruit, called "be-ya-dau", is said to be eaten.

ARTICLE 7.
NEONICHOLSONIA vs. WOODSONIA.

NEONICHOLSONIA, Dammer, in Gard. Chron. ser 3, xxx, 178 fig. 56 C, g-j (1901). Fig. 99, 100.

Bisnicholsonia, Kuntze, Post & Kuntze Lex. Inserenda & p. 621 (1904).

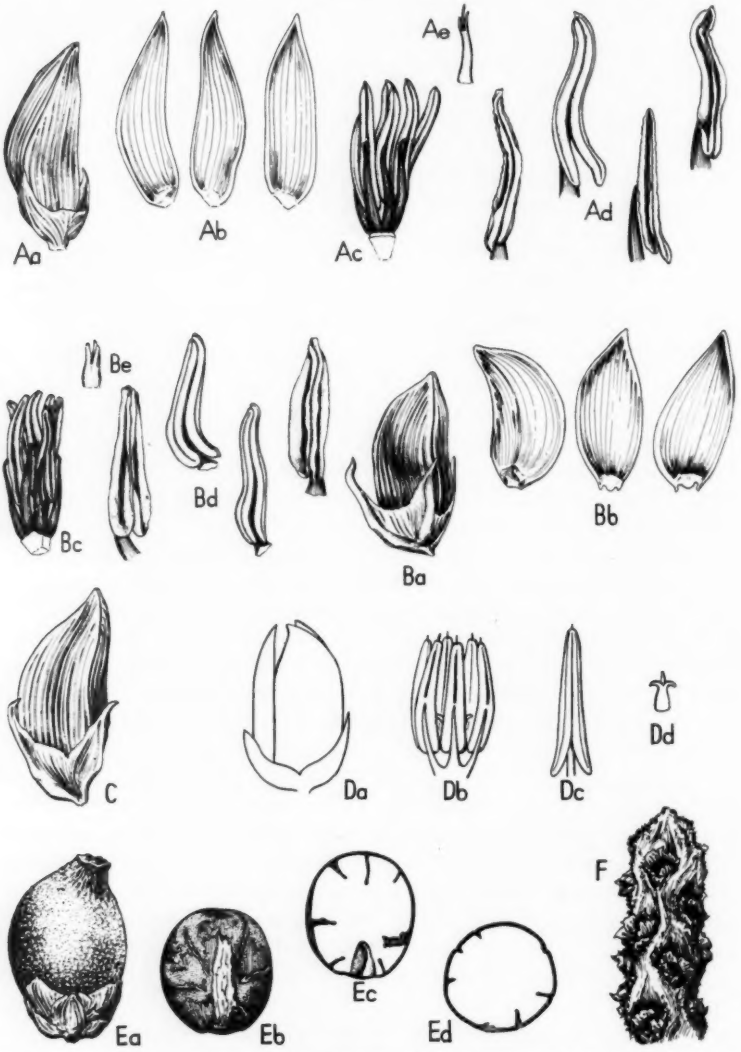
Woodsonia, Bailey, Gent. Herb. vi, 262 (1943).

During the summer of 1949 a series of palm collections was made in Costa Rica by R. W. Holm and H. H. Iltis. Included was material of a singular species, at first determined by Iltis as *Woodsonia Scheryi,* Bailey. In working out the identity of this specimen striking similarities with an older genus Neonicholsonia, Dammer were noted by him. This information, together with informal notes, was communicated to Dr. Bailey who, with myself, restudied the relationship of the two genera.

In describing Woodsonia Dr. Bailey noted that further studies of the genus were required. Examination of a more adequate series of specimens leads us to the conclusion that Woodsonia is synonymous with Neonicholsonia and spathes and fruit, which Dammer noted merely with the word "*bacca*", can be described. The relationship of Neonicholsonia is still not clear but in many respects it appears much closer to Euterpe and its allies than to the Geonomeæ where Dammer placed it by implication. Disposition must await careful study of the American arecoid palms.

Dammer described Neonicholsonia from two collections sent him from Costa Rica, one accompanied by fresh seed but apparently without flowers, the other with staminate flowers. He contrasted his new genus with Asterogyne and Calyptrogyne, both of which have the stamen-filaments united in a column and the anthers non-sagittate or with a short connective. The stamens of Neonicholsonia were described and illustrated as free or connate only at the base with sagittate anthers and an elongate apiculate connective. The pistillode is described and figured as short and trifid.

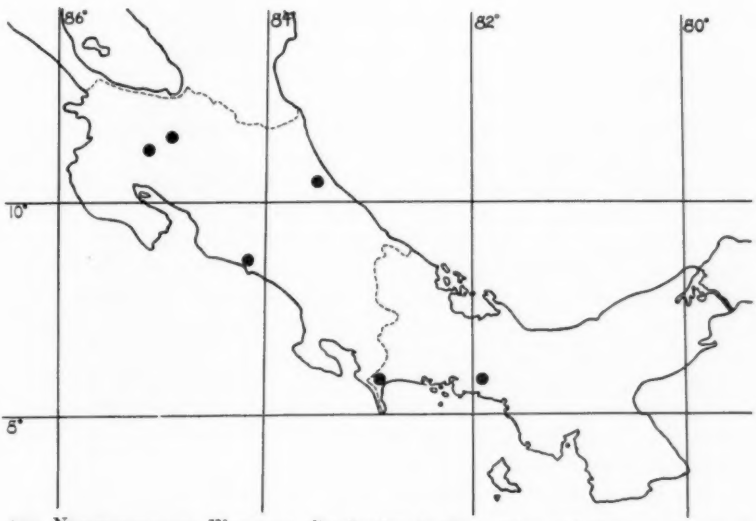
Woodsonia, similarly, has free or very shortly connate stamens, elongate sagittate anthers and slender trifid pistillode. Both genera have similar leaves with quadrangular petioles, slender simple spadices with straw-colored flowers only slightly sunken in the rachis borne in triads of one pistillate and two staminate below becoming all staminate toward the apex by abortion of the pistillate. In fruit the staminate scars are extremely



99. NEONICHOLSONIA WATSONII. Aa, Ab, staminate flower and petals ×5; Ac, androecium ×5; Ad, stamens ×7; Ae, pistillode ×5 (*Woodson & Schery 894*); Ba, Bb, staminate flower and petals ×5; Be, androecium ×5; Bd, stamens ×7; Be, pistillode ×5 (*Holm & Iltis 908*); C, staminate flower ×5 (*Dodge & Goerger 9875*); Da, staminate flower; Db, androecium; Dc, stamen; Dd, pistillode (redrawn from Dammer); Ea, fruit ×3; Eb, Ec, Ed, seed, raphal view, longitudinal and cross-sections ×3 (*Tonduz 7569*); F, portion of rachis ×3.

difficult to observe and the spike gives the appearance of unisexuality. Iltis has pointed out in correspondence that the connective tissue of the anthers contains long bundles of spicule-like crystals dissolving readily in hydrochloric acid and appearing as short white light-refracting spots just below the epidermis. Neonicholsonia was described as acaulescent, apparently on the basis of material cultivated by Dammer, while the caudex of Woodsonia reaches a height of 2–3 meters.

The only apparent difference between the two genera lies in the sagittate base of the anthers of Neonicholsonia and the connective that was said to be produced in a slender minute micro (Fig. 99D). Dissection of flowers from Costa Rican specimens (Fig. 99B) shows these characters to be somewhat misleading. The anthers are basally sagittate to various degrees but this may or may not be obvious depending on age and position of anther. The connective may or may not be slightly prolonged but the locules are generally unequal, one extending beyond the other and giving the impression of a mucro. Equivalent series are found in Woodsonia (Fig. 99A). Even in the pistillode, which tends to be more slender and elongate in the Panamanian material, a series is found that allows no sharp distinction. Thus the key characters used in Flora of Panama (Ann. Mo. Bot. Gard. xxx, 330, 1943) do not hold and the two genera should now be considered one.



100. NEONICHOLSONIA WATSONII, distribution in Costa Rica and Panama. Courtesy H. H. Iltis.

To previous descriptions, that of complete spathes and mature fruit may be added:

Spathes 2, the outer ancipitous, striate, glabrous, closely sheathing, about one-third as long as peduncle, the inner coriaceous, striate, glabrous, slender and narrow, equalling the spadix: fruit ovoid with prominent rostrate apical stigmatic scar, subtended by accrescent perianth; exocarp smooth but somewhat striate, thin and dry; mesocarp thin, fibrous; endocarp membranaceous; seed ovoid, raphe branched basally and laterally, extending nearly length of seed; endosperm ruminate, embryo basal.

Neonicholsonia Watsonii, Dammer, in Gard. Chron. ser. 3, xxx, 179 (1901).

Neonicholsonia Georgei, Dammer, op. cit. 178.

Woodsonia Scheryi, Bailey, Gent. Herb. vi, 262, fig. 139 (1943).

The differences noted by previous writers do not seem adequate to distinguish species when a series of specimens is at hand. The types of the two species of Neonicholsonia formerly at Berlin (not Kew as cited by Dahlgren, Index Amer. Palms, 214, 1936), are no longer extant but the descriptions are detailed. *N. Watsonii* was separated from *N. Georgei* on the basis of a longer leaf (6 feet vs. 4½ feet), pinnæ 9–10 vs. 10–11 on each side, and differences in length and width of pinnæ. In specimens examined for this study considerable uncorrelated variation was observed, the plants ranging from acaulescent to caulescent with stems to 3 meters high, the pinnæ from 9–20 per side at intervals of 5–12 – (17) cm. and from 30–46 cm. long, 0.8–5 cm. wide. Spadices vary from 30–55 cm. or more in length (30–45 cm. in the type of *Woodsonia Scheryi* alone) but staminate flowers are constantly 6–7 mm. long. Mature fruit is 8–9 mm. high and 5–6 mm. wide except for occasional sterile monstrous (parthenocarpic?) examples that are sausage-shaped, 1.5 cm. long and 2.5 mm. thick.

There are discernible differences between extremes of staminate flowers. In the Panama collection (Fig. 99A) the calyx is short, thickish and scarcely keeled, the petals are narrow and the pistillode is elongate. In contrast some Costa Rican material (Fig. 99B) has a longer prominently keeled calyx, somewhat broader petals and short pistillode, while other is rather intermediate (Fig. 99C). Without additional and stable characters these differences do not seem adequate to maintain *Woodsonia Scheryi* as a separate species in Neonicholsonia. It is accordingly left in synonymy until further collections provide evidence to the contrary.

In deference to Dammer's desire to recognize both Nicholson and Watson of Kew the specific epithet *Watsonii* is retained in combining species, no previous disposition having been found.

Costa Rica: Province Alajuela; low tropical rainforest, vicinity of Guatusco de San Rafael (on Rio Frio) (10°43′N, 84°48′W), 80–100 m., August 4, 1949, *R. W. Holm & H. H. Iltis 908* (MO.): Province Guana-

caste; vicinity of Tilarán, 500–600 m., January 10–31, 1926, *Standley & J. Valerio 4254* (US.): Province Limon; forest near farmhouse at Finca Castilla, 30 m., July 29, 1936, *Dodge & Goerger 9500* (F., MO.): Province Puntarenas; forêts du Rio Naranjo versant Pacifique, March 1893, *H. Pittier 7513* (BR.); forêts du Rio Naranjo, 200–250 m., March 1893, *Ad. Tonduz 7569* (BR.): Province San José; low hills above Rio Paquita, 5–50 m., August 15, 1936, *Dodge & Goerger 9875* (F., MO.).

Panama: Province Chiriquí; vicinity of San Bartolomé, Peninsula de Burica, 0–50 m., July 28–August 1940, *R. E. Woodson, Jr. & R. W. Schery 894* (BH. type of *Woodsonia Scheryi*, MO. isotype); in forests, Cerro de la Plata, near San Felix, eastern Chiriquí, 120–150 m., December 27, 1911, *H. Pittier 5167* (F., US.).

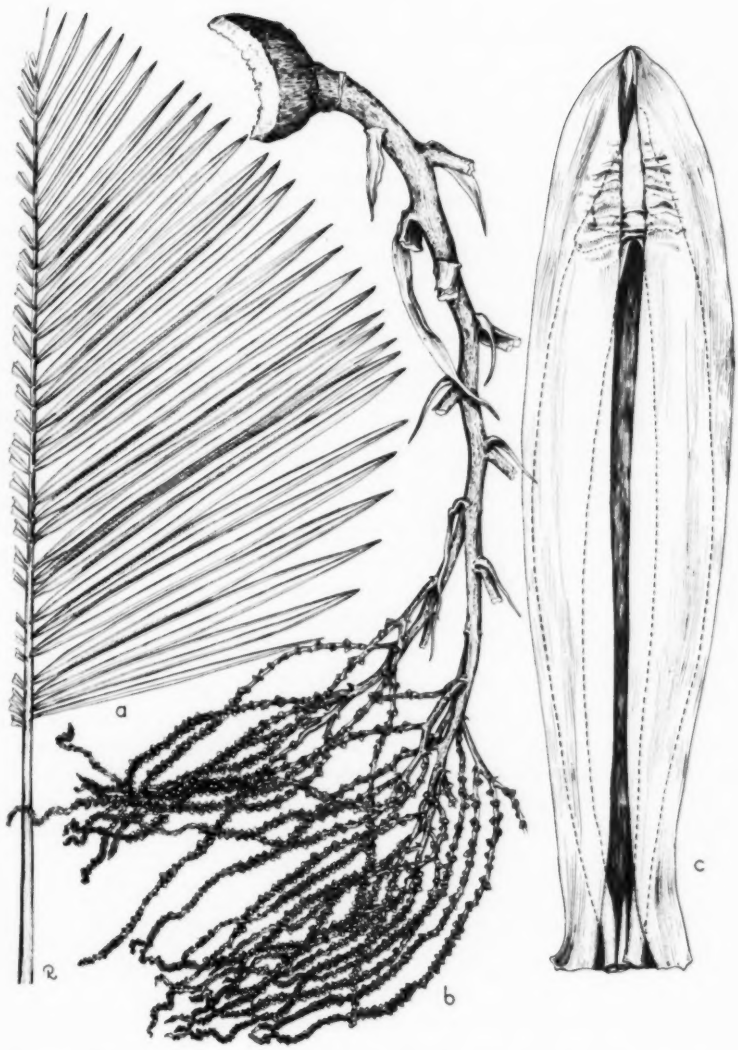
ARTICLE 8.
CLINOSPERMA.

The genus Clinosperma, Becc. was erected on a single species, *Clinosperma bractealis*, (Brongn.) Becc. (*Cyphokentia bractealis*, Brongn.), of which only inflorescence parts seem to have been described heretofore.

While in southeastern New Caledonia in January 1950, Professor L. H. MacDaniels of Cornell University collected a small palm in the kauri forest above St. Louis. The inflorescence, flowers and fruit of this collection correspond exactly with Beccari's detailed diagnosis and illustrations (Webbia v, 119–122, t. 10, 1921). To his description may now be added the following:

Clinosperma bractealis, (Brongn.) Becc. Fig. 101.

Slender-trunked tree 10–17 m. high: leaves pinnate, the sheath 60 cm. long, thinly white-ceraceous outside with castaneous, basifixed, twisted laciniate scales becoming glabrescent, yellow within; petiole 60 cm. long, 2.5 cm. diameter at base, glabrous, rounded underneath, channelled on upper surface at base becoming terete above; rachis 120 cm. long, glabrous, rounded below, triangular above; pinnæ 31 to a side, the lowermost in a group of 3, the remainder subopposite, acute, firm, green and glabrous above and below, lowermost 75 cm. long x 4.5 cm. wide, median 60 cm. long x 3 cm. wide, upper 27 cm. long x 1.5 cm. wide, terminal about 20 cm. long x 2 cm. wide, the midvein and marginal nerves prominent, the intermediate numerous and fine: spadix red, 2–3-branched, 50 cm. long or more; spathes 2, the outer firm, ancipitous, thinly white-ceraceous becoming glabrous, 42 cm. long, 10 cm. wide, the inner softer, not ancipitous, densely white-ceraceous and sparsely brown-scaly, 40 cm. long x ca. 8.5 cm. wide.



101. CLINOSPERMA BRACTEALIS. a, leaf ×1/12; b, spadix ×⅓; c, spathes ×⅓.

ARTICLE 9.
NEW NAMES IN ANTHERICUM.

An attempt to produce order in the species of Anthericum indigenous to the western hemisphere has indicated a need for more adequate material and further field and laboratory study. At present it is possible to separate the most distinctive species, but two groups, a complex of broad-leaved South American species (*A. eccremorrhizum*, Ruiz. & Pav. and allies) and a complex of narrow-leaved Mexican and Central American species (*A. leptophyllum*, Baker and allies) have not been successfully resolved. Certain nomenclatural changes and additions to synonymy, however, are here presented for convenience in future reference.

Baker, in his revision of Anthericum (Journ. Linn. Soc. xv, 290–318, 1876), and the compilers of Index Kewensis overlooked descriptions of Schlechtendal and Koch in Trachyandra and Echeandia. These descriptions clearly apply to Mexican species today known by other names, and new combinations or additions to synonymy are necessary. In addition, the examination of types in European herbaria in the summer of 1950 has clarified the status of at least one species currently known by several names and application of the homonym rule affects another. I am indebted to Dr. Bernice G. Schubert for assistance in obtaining the description of *Echeandia eleutherandra*.

† **Anthericum condensum,** nom. nov.

Trachyandra nana, Schlecht. in Bot. Zeit. iii, 627 (1845), not *Anthericum nanum*, Baker, in Journ. Linn. Soc. xv, 305 (1876).

The epithet *condensum* applies well to this tiny species of local distribution in the mountains above Pachuca and Real del Monte, state of Hidalgo, Mexico. Recent collections from the area (*Moore 3140, Moore & Wood 3722, 4112*) agree in detail with Schlechtendal's description based on plants collected by Ehrenberg between Real del Monte and Pachuca.

† **Anthericum eleutherandrum,** (Koch) trans. nov.

Trachyandra echeandioides, Schlecht. in Bot. Zeit. iii, 629 (1845), not *Anthericum echeandioides*, Baker quoad typus.

Echeandia eleutherandra, Koch, Ind. Sem. Hort. Berol. App. 4 (1861).

Anthericum echeandioides, Baker, in Bot. Mag. t. 6809 (1885).

Anthericum platyphyllum, Greenman, in Proc. Amer. Acad. xxxiii, 472 (1898).

The synonymy of this species is clarified by accounts of the cited authors. Schlechtendal's description was drawn from plants collected by Schiede at Angangueo (Michoacán, Mexico). Plants under Schlechtendal's name, presumably grown from seed at Halle, were sent to Berlin where Koch, disagreeing with their reference to Trachyandra, redescribed the species but with no indication that he was aware of Schlechtendal's previous publication. Baker described *Anthericum echeandioides* from material received from the Cambridge Botanical Garden, noting that it was the same as that brought by Vatke from Berlin under the unpublished name *Echeandia eleutherandra*, Koch, apparently unaware of Koch's excellent and detailed treatment. Greenman cites *Trachyandra echeandioides*, Schlecht. with a query as possibly synonymous with his *A. platyphyllum* but excludes Baker's *Anthericum echeandioides*. Thus the four names are linked and the descriptions similarly apply.

The chief distinctions between *A. platyphyllum* and *A. echeandioides* appear to be in the smaller flowers of the former subtended by shorter ovate bracts, characters that vary considerably in a single well-developed plant, and in the branched inflorescence. From field observation in western Mexico it becomes evident that the latter is the result of age or habitat and I cannot find other justification for separation.

Anthericum nanum, Baker, in Journ. Linn. Soc. xv, 305 (1876).

Phalangium pusillum, Schlecht. in Bot. Zeit. iii, 642 (1845), not *A. pusillum*, Jacq. Coll. Suppl. 95 (1796).

The type of Schlechtendal's species has not been seen but his excellent description and discussion leave no doubt that it is the same as *Anthericum nanum*. *Phalangium pusillum* must be relegated to synonymy due to Jacquin's earlier use of the epithet.

Anthericum panamense, Standl. in Field Mus. Nat. Hist. Publ. Bot. xxii, 327 (1940).

A. macrophyllum, Baker ex Hemsl. Biol. Centr. Amer. (Bot.) iv, 91 (1886), nomen; Engler Bot. Jahrb. viii, 209 (1887), not *A. macrophyllum*, A. Rich. Ten. Fl. Abyss. ii, 334 (1851).

Only one species of Anthericum, *A. apodastanthum*, Donn.-Smith, is listed by Standley in the Flora of Costa Rica (Field Mus. Nat. Hist. Publ. Bot. xviii, 168, 1937) although the type of *A. macrophyllum*, Baker was collected near the Rio Blanco, Costa Rica. The same species occurs in Panama and was later described as *A. panamense*. It is listed in the Flora of Panama (Woodson, Schery et al, Fl. Panama iii, 3, 1945) as *A. macrophyllum*, Baker but should be superseded by *A. panamense* since Baker's epithet is a later homonym. An examination of the types of both species leaves no doubt as to their identity.

Anthericum vestitum, Baker, in Journ. Linn. Soc. xv, 307 (1876).

A. nanum var. *rude,* Baker, op. cit. 306.

A. leucocomum, Rob. & Greenman, in Amer. Journ. Sci. l, 168 (1895).

A. crinitum, Standl. in Field Mus. Nat. Hist. Publ. Bot. xvii, 228 (1937).

Anthericum vestitum is one of the most distinct of those American species having smooth stamen-filaments. The dense pilosity of stem and leaves at once sets it apart from the remainder. From Baker's description and the type itself, this species might seem separable from those assigned to synonymy as the leaves are more or less erect, only 2.5–3 mm. wide, and the flowers are described as white. Examination of the type at Kew leaves considerable doubt regarding flower color for the tepals are not clear white and there is no notation regarding flowers by the collector. It is more than likely that the present coloration is due to drying, for the type was collected by Müller between Vera Cruz and Orizaba and a modern collection from the region of Orizaba (*R. W. Schery 200,* MO.) has yellow flowers.

A letter on the sheet of *Pringle 4783* at the Gray Herbarium, that I would designate as the type of *A. leucocomum,* indicates that material of the collection was compared with the type of *A. vestitum* at Kew and considered distinct by the examiner. At first glance this would appear to be true as the Pringle specimens have broader leaves and yellow flowers. On study of additional collections, however, these distinctions do not appear to hold. In the herbarium at Kew is a sheet bearing two plants collected by Andrieux on the Sierra de San Felipe, Oaxaca, one with narrow erect leaves, one with recurved broader leaves with a note to the effect that the flowers are "dilute flavo." There are two labels, one, no. 65 dated April 1834, the other with two numbers, 65 and 287, dated July 1834. The specimens are not clearly placed with reference to the labels hence one cannot conclude that they represent seasonal phases but they do represent the type of variation found in examining a larger suite of specimens.

The type of *A. nanum* var *rude, Jurgensen 698* at Kew, was collected in Oaxaca and is similar to most other collections from that state in its broad leaves. It is possible that its low stature and recurved leaves led Baker to place it with the quite different *A. nanum.* The type of *A. crinitum,* described from Guatemala, is clearly referable here as are several other Guatemalan collections.

Anthericum serotinum Baker, in Engler Bot. Jahrb. xv, beibl. 35, 9 (1892), not L.

An isotype of this species in the herbarium of the Missouri Botanical Garden has been examined. It is *Camassia scilloides*, (Raf.) Cory and is therefore excluded from Anthericum.

Three combinations under Anthericum were inadvertently made when the editors listed *Anthurium longipes*, N. E. Br. and *A. parvum*, N. E. Br. (Index Kewensis, page 147) and *A. sylvestre*, S. Moore (Suppl. i, 492) as species of Anthericum.

ARTICLE 10.
NOTES ON NEW WORLD GERANIA.

Since publication of my revision of the Mexican and Central American species of Geranium (Contr. Gray Herb. cxlvi, 1943), material requiring a change in the application of two names and the addition of a third has become available. Recent collections have extended the known ranges of several species, provided supplementary information for descriptions, and added two new species to the flora of northern South America. The following notes, therefore, are offered in correction and amplification of the previous work.

Geranium Hernandesii: a correction

In previously discussing *Geranium Hernandesii*, Moç. & Sessé ex DC., the name was applied (and incorrectly spelled Hernandezii) with some doubt on an interpretation of the tracing of the Moçiño and Sessé plate in the Gray Herbarium. Through the courtesy of the Director and the Curator of the Herbarium of the Chicago Natural History Museum, I have had the privilege of examining the Sessé and Moçiño collection from Mexico and a photograph of the more detailed tracing of the type-plate in the Delessert Herbarium. The Sessé and Moçiño collection is very similar to (and may well be the same collection) a specimen I have seen in the Delessert Herbarium in Geneva marked "Perou, M. Pavon 1827, plus probablement du Mexique" with a reference to DeCandolle Prodromus i, p. 640 n. 25. I found no specimen in a search of the DeCandolle Herbarium itself. Although the species was based on the Moçiño and Sessé plate and a reference to Hernandez, one may reasonably consider the actual specimens to be authentic material. The tracing agrees in detail with the Sessé and Moçiño specimens except that the peduncles are shorter, perhaps so illustrated because of space limitation. Through the specimens and illustration the species is readily identified with that now known as *G. aristisepalum*, H. E. Moore.

Those specimens to which I formerly applied the name *G. Hernandesii* now seem to be no more than a southern phase of the more northern *G. deltoideum*, Rydb., differing in the darker often reddish-tinged mucronulate-lobed leaves, coarser pubescence, usually larger flowers and generally less-branched habit but intergrading so that separation is no longer tenable even in a subspecific category. Three recent collections may be cited as intergrades: *Sharp 45503* and *Moore & Wood 4846* from Michoacán with mucronulate leaf-lobes and small flowers, and *Gentry 7188* from Sinaloa

with more obtuse lobing of the leaves, larger flowers having petals 15 mm. long and 12 mm. wide, and style-beak 6 mm. long. *Ortega s.n.* and *Arsène 9001*, both in the United States National Herbarium and previously cited as *G. Hernandesii*, are further intermediates.

The corrected synonymy of the species involved, with added citations, becomes:

Geranium Hernandesii, Moç. & Sessé ex DC. var. **Hernandesii.**

G. Hernandesii, Moç. & Sessé ex DC. Prodr. i, 640 (1824).

G. aristatum, Small ex Hanks & Small, in N. Amer. Fl. xxv, 19 (1907).

G. aristisepalum, H. E. Moore var. *typicum*, in Contr. Gray Herb. cxlvi, 64 (1943).

Mexico: without data, *Sessé, Moçiño, Castillo and Maldonado 3257* (F.); *Pavon* anno 1827 labelled Perou but certainly in error (G-Del.).

† **Geranium Hernandesii** var. **michoacanum,** (H. E. Moore) trans. nov.

G. aristisepalum, H. E. Moore, var. *michoacanum*, H. E. Moore, in Contr. Gray Herb. cxlvi, 65 (1943).

Geranium deltoideum, Rydb. ex Hanks & Small, in N. Amer. Fl. xxv, 18 (1907); H. E. Moore, in Contr. Gray Herb. cxlvi, 67 (1943).

G. Hernandesii, sensu Moore, op. cit. 65.

Mexico: Sinaloa; Los Pucheros, Sierra Surotato, 5500–6500 feet, March 17–24, 1945, *H. S. Gentry 7188* (PH.): Jalisco; about 15 miles southeast of Autlán, near summit of mountains below El Cuartón, along trail from Chante about four hours with pack animals above Rancho Manantlán, 2700–3000 m., April 13, 1949, *R. McVaugh 10289* (MICH.): Michoacán; dry slope in cone near Las Cabras, 7700 feet, June 16, 1945, *A. J. Sharp 45503* (BH., TENN.); about 48 kms. from Pátzcuaro on road to Tacámbaro, 6000–7000 feet, September 2, 1948, *Moore & Wood 4846* (BH., GH.).

Range extensions and supplementary notes

Geranium alpicola, Loes. was collected by E. K. Balls (*no. 4638*, US.) at La Zimienta, Cofre de Perote, Vera Cruz, Mexico, alt. 10,500 feet, in 1938 but specimens have been seen only recently. This collection extends the range of the species north from Oaxaca. The collector noted that the roots and stems spread over large areas underground sending up tufted growths in all directions. The plants are said to form great carpets six feet across or more in deep moss and humus of pine woods. It occurs less frequently in more open ground.

Geranium andicola, Loes., a species of the Guatemalan highlands, can now be added to the Mexican flora on the basis of plants collected on Mt. Male, near Porvenir, Chiapas, July 6, 1941, *E. Matuda 4705* (GH.).

Geranium bellum, Rose, formerly known from only two areas in the state of Hidalgo, has recently been collected on the upper slopes of El Monte, August 11, 1948, *Moore & Wood 4471* (BH.) and near Rancho Encarnación, August 6, 1948, *Moore & Wood 4324* (BH.), both in the district of Zimapán, Hidalgo and between San Luis de la Paz and Xichú, State of Guanajuato, August 20, 1947, *L. A. Kenoyer 2323* (GH.). *Coulter 764* (GH.) cited (Contr. Gray Herb. cxlvi, 51) as from Xalapa, Hidalgo in error for Jalapa, Vera Cruz, is a mixed sheet of *G. Schiedeanum*, Schlecht. and *G. bellum*, the former perhaps from Jalapa, the latter or both probably from Real del Monte or Zimapán where Coulter collected intensively and where both species are known to occur. The same number in the Kew Herbarium is *G. bellum*. *G. Schiedeanum* is abundant in areas near Jalapa but personal search has failed to locate *G. bellum* there nor does it appear in the extensive Vera Cruz collections of others who have botanized the area.

Geranium crenatifolium, H. E. Moore, was collected in several localities in the state of Durango, Mexico, by James H. Maysilles during June and July of 1950. This species had been known previously from Nuevo Leon, Coahuila and Tamaulipas. The Durango stations considerably extend the range westward. From the collector's notes it appears that *G. crenatifolium* occurs in a variety of habitats from open rocky fields to pine forests mostly at elevations close to 3000 meters. The flowers range from white or white with pink veins to pale pink with red veins and average paler than most of those previously studied. The following collections may be cited, all by Maysilles:

Mexico: Durango; 3 miles northeast of Otinapa (*nos. 7309, 7341*, MICH.); along highway between Llano Grande and Las Rucias, 65 miles by road south-southwest of C. Durango (*7086A*, BH., MICH.); north slopes of Cerro Huehueto (Huehuento) south of Huachicheles, about 75 miles west of C. Durango (*7256*, BH.); east slope of Cerro Prieto, about 20 airline miles west of Otinapa (*7343* BH.).

Geranium oaxacanum, H. E. Moore, previously known from a limited area in the state of Oaxaca, has been collected in Guatemala on pine-wooded slopes along the Rio Selegua, opposite San Sebastián H., Department Huehuetenango, August 13, 1942, *Steyermark 50472* (F.), and in Mexico on the summit of mountains northeast of Chilpancingo on road to Chilapa, State of Guerrero, August 19, 1948, *Moore & Wood 4648* (BH.). This species is not accounted for in Standley & Steyermark's Flora of Guatemala.

Geranium potosinum, H. E. Moore. A second collection from the type

locality (*A. J. Sharp 45738*, BH., TENN.) has a well-developed rhizome nearly 2 dm. long and 2.5–3 mm. thick bearing 3 lateral branches. Old petiole-bases and stipules are alternate along the rhizome with the leaves congested at the apex, a condition noted in species of Knuth's section Andina, but here there is a well-developed upright stem bearing opposite cauline leaves.

Geranium unguiculatum, H. E. Moore. Mexico: Guerrero: District Mina; Fresnos-Cuesta, alt. 1920 m., *Hinton 9736* (GH.). Accompanying field notes indicate that plants may reach 1.5 m. in height and it is evident from this collection that the petals are spreading and not recurved in anthesis as was believed previously. An incomplete fruit measures 21 mm. long excluding the style-beak and the column is glandular-pubescent. The seeds are coarsely reticulate and about 2 mm. long.

A new name and two new species

† **Geranium costaricense,** nom. nov.

G. cucullatum, HBK. var. *multifidum*, Suessenguth, in Engler Bot. Jahrb. lxxii, 276 (1942).

A new name or a new combination under *Geranium sibbaldioides*, Benth. (*G. cucullatum*, HBK. not L.) is required for the plant described by Suessenguth. Perhaps when the species of Knuth's section Andina are better understood a varietal designation will be in order. On the basis of present evidence I prefer to redesignate it with specific rank. The new name is used since *G. multifidum*, Benth. preemts transfer of the varietal epithet.

Through the courtesy of Dr. Suessenguth I was privileged to study the type of this species at the herbarium of the Botanische Anstalten in Munich in the summer of 1950. A second collection, *W. A. Dayton 3082*, from near the summit of Dos Burros Peaks, Cerro de la Muerte, Province San José, Costa Rica, alt. 11000 feet, May 14, 1943, has also been available for study through the kindness of the authorities of the Chicago Natural History Museum.

This species differs from *G. sibbaldioides* in having much larger leaves up to 18 mm. in diameter with lobes narrowly 2–4-lobulate to or below the middle, stipules to 13 mm. long, peduncles exceeding the leaves and a style-beak 1.5 mm. long in flower. Although obviously closely related, this combination of characters provides as strong a separation as is to be found among related species.

The flowers are said to be white by Dayton and those of the type appear similar. The petals are 10–12 mm. long with reticulate venation and the sepals are 6 mm. long with an awn 0.5 mm. long, nearly glabrous except for the ciliate margin and a small patch of hairs on the inner surface of the

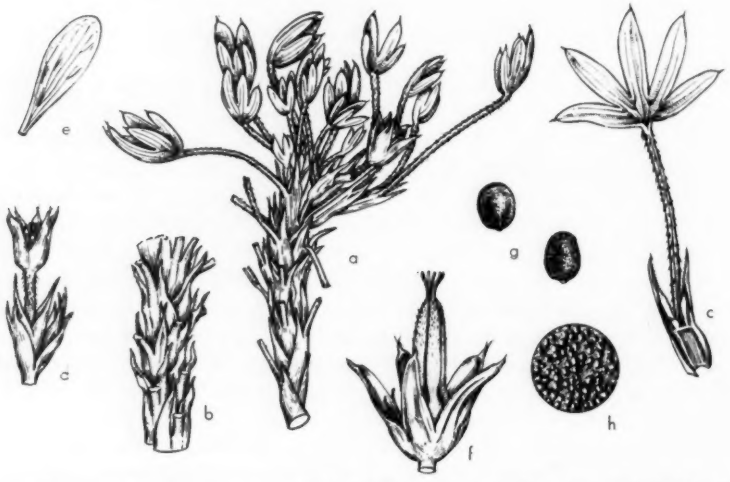
awn. Suessenguth notes that the margins of the sepals are purplish, not fuscous, but similar coloration is evident on some collections of *G. sibbaldioides*.

Geranium costaricense was not known to me at the time of my revision and is the first representative of Knuth's section Andina known from the northern hemisphere. It superficially resembles *Geranium alpicola*, Loes. in habit but is readily distinguished by the glabrous leaf-surface, retrorse pubescence of the peduncle and less deeply cut leaves.

† **Geranium maniculatum,** spec. nov. Fig. 102.

Herba perennis caulibus gracilibus prostratis lignosis cæspitosis: folia alterna ad apicem caulium congesta, petiolo 1.5–2 cm. longo, retrorso-strigoso, lamina 8–9 mm. longa, 10–13 mm. lata, in ambitu semiorbiculari, usque ad ¾ palmato-5-partita, lobis lineari-lanceolatis, integris, glabris: pedunculi 3 ad apicem trifurcatum caulis, 3–4 mm. longi, uniflori, pedicellis 5–7 mm. longis, retrorso-strigosis; flores albi, sepalis lanceolatis 5–6 mm. longis, glabris vel ad basin sparsim strigosis, petalis late oblanceolatis, 7.5–8 mm. longis, 2.4–2.5 mm. latis, venis 5, ad basin liberis et versus apicem reticulatis: fructus ca. 8.5 mm. longus, stigmatibus 1.5 mm. longis, columna stylorum 5 mm. longa, hispidula, ad rostrum abrupte angustata, carpello 2 mm. longo, strigilloso demum glabro; semen in ambitu oblongum, 1.8 mm. longum, 1.2 mm. latum, papillosum.

Perennial herb with slender, branching, prostrate, woody stems 1.5–3 mm. thick, 2.5–10 cm. long or more, clothed with persistent stipules and disintegrated leaf-bases, often rooting at the nodes and forming compact



102. GERANIUM MANICULATUM. a, plant ×1½; b, stem portion ×2; c, leaf ×2; d, peduncle and young fruit ×1½; e, petal ×3; f, fruit ×3; g, seed, ventral and dorsal views ×6; h, portion of seed-coat much magnified.

prostrate mats: leaves alternate, crowded at the apices of the stems and appearing basal; petioles 1.5–2 cm. long, retrorse-strigose; stipules ca. 8 mm. long, adnate one-half their length to the petiole, lanceolate-attenuate, shining brown, glabrous and ciliate, 1-nerved, the nerve produced in a slender often setose awn; blade 8–9 mm. long, 10–13 mm. wide, semi-orbicular in outline, parted three-fourths or more to the base into 5 or very rarely 3 linear-lanceolate entire lobes, coriaceous, somewhat vernicose, glabrous above and below, the veins impressed above, the apices often with 1–2 setæ: peduncles 3–4 mm. long, 2–4-bracteolate, retrorse-strigose, 1-flowered, borne 3 together at the trifurcate apex of the stem; pedicels 5–7 mm. long, shorter than the leaves, retrorse-strigose; flowers white (fide Steyermark), sepals 5–6 mm. long, lanceolate, glabrous or very sparsely strigose at the base and setose at the acute shortly mucronulate apex, 3-nerved, the nerves not prominent when dry, petals broadly oblanceolate, 7.5–8 mm. long, 2.4–2.5 mm. wide at apex, 5-nerved, the nerves free at the base and somewhat anastamosed apically, glabrous, stamen-filaments about one-half as long as the petals, glabrous or sparsely ciliate: fruit about 8.5 mm. long, the column 5 mm. long, antrorsely hispidulous, abruptly narrowed to a style-beak 1.5 mm. long, carpel-body 2 mm. long strigillose to glabrous; seeds oblong in outline, 1.8 mm. long, 1.2 mm. wide, shining brown, dark-brown papillate.

Ecuador: Province Azuay; páramos, in the vicinity of Toreador, between Molleturo and Quinoas, alt. 3810–3930 m., June 15, 1943, *Steyermark 53159* (BH. type, F. isotype).

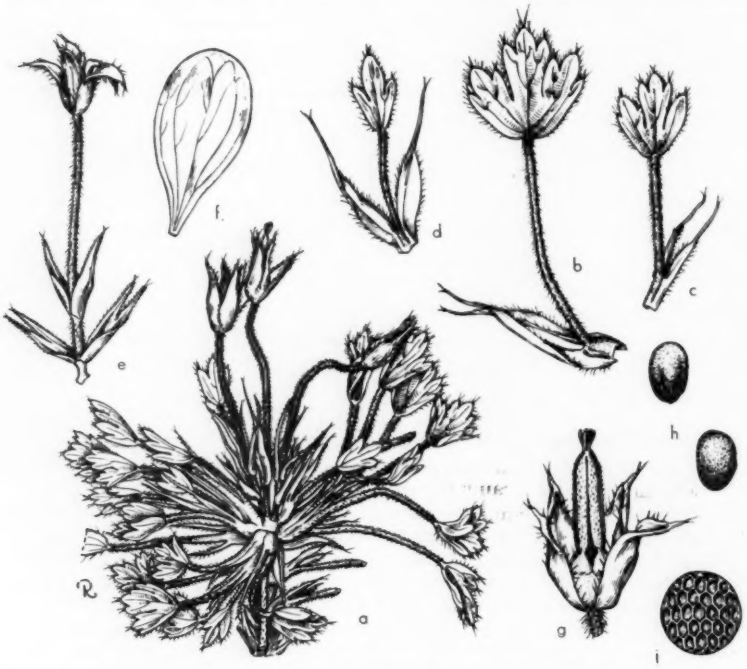
Geranium maniculatum, so named because of its 5-lobed leaf that folds in a manner suggestive of a small hand, is closely related to *G. Jackelæ*, Macbride and *G. sibbaldioides*, Benth. From the former it may be distinguished by the larger leaves with linear-lanceolate not broadly obovate lobes, retrorse-strigose petioles and narrow petals and from the latter by the leaves with narrow, entire, eciliate not obovate, often trilobulate, ciliate lobes, strigose petioles and pedicels and seed. As in *G. sibbaldioides*, *G. rhomboidale* described next and presumably other species of the section, the peduncles are in threes at the apex of a stem that branches below them and the leaves are alternate.

† **Geranium rhomboidale,** spec. nov. Fig. 103.

Herba perennis, caulibus gracilibus, prostratis, lignosis, cæspitosis: folia alterna ad apicem caulium congesta, petiolo 1.5–2 cm. longo retrorso- vel patulo-hispidulo, lamina 6–8 mm. longa, 7–9 mm. lata, in ambitu late rhomboidali, ad basin cuneata, usque ad ⅔–¾ palmato-3-partita, lobis glabris, ciliatis, vix profunde 2–3-dentatis: pedunculi 3 ad apicem trifurcatum caulis 2–6 mm. longi, uniflori, pedicellis 1.8–2 cm. longis, retrorso- vel patulo-hispidulis; flores violacei, sepalis anguste lanceolatis, ca. 6.2 mm. longis, breviter mucronatis mucrone 0.8 mm. longo, glabris, ciliatis, petalis cuneato-obovatis, 10.5–11 mm. longis, 4–4.5 mm. latis, glabris, venis 5 ad basin liberis et versus apicem reticulatis: fructus 8–9 mm. longus, stigmatibus 1.2–1.5 mm. longis, columna stylorum 5 mm. longa, dense hispidula, ad rostrum abrupte angustata, carpello 2.5 mm.

longo, glabro vel sparsim ciliato; semen in ambitu oblongum, 1.5 mm. longum, 1 mm. latum, minute reticulatum.

Perennial herb with numerous, slender, prostrate, woody stems 1–3 mm. thick, 5–10 cm. long or more, clothed with persistent stipules and disintegrated leaf-bases, often rooting at the nodes and forming compact mats: leaves alternate along the stem, congested apically and appearing basal; petioles 1.5–2 cm. long, retrorse- or spreading-hispidulous, often reddish; stipules 8–10 mm. long, adnate about one-third their length to the petiole, lanceolate-attenuate, 1-nerved, the nerve produced in a long slender awn for one-third to one-half its length, shining brown and glabrous except for the ciliate margin and rarely puberulent nerve; blades 6–8 mm. long, 7–9 mm. wide, broadly rhomboid in outline, green above, green or reddish below, membranaceous, the nerves deeply impressed above, glabrous above and below except for the ciliate margin, parted two-thirds to three-fourths to the base into 3 cuneate-obovate lobes, lobes entire to mostly shallowly 2–3-toothed with apical setæ, the median slightly longer than the laterals: peduncles 2–6 mm. long, borne 3 together at the trifurcate apex of the flowering stem, 2–4-bracteolate, 1-flowered; pedicels 1.8–2.2 cm. long, retrorse- or spreading-hispidulous, reddish,



103. GERANIUM RHOMBOIDALE. a, plant ×1½; b, c, d, outer and inner leaves ×2; e, peduncle and young fruit ×1½; f, petal ×3; g, fruit ×3; h, seed, ventral and lateral views ×6; i, portion of seed-coat much magnified.

bracteoles about 8 mm. long, shining brown, linear-lanceolate, glabrous except for the ciliate margins: flowers violet (fide Schultes), outer sepals narrowly-lanceolate, the body ca. 6.2 mm. long, 1.5 mm. wide with a setose mucrone 0.8 mm. long, ciliate, 3-nerved, the nerves prominent in fruit; petals cuneate-obovate, 10.5–11 mm. long, 4–4.5 mm. wide, 5-veined, the veins free at the base and somewhat anastamosed toward the entire apex, glabrous or minutely ciliate along the margin at the base; stamen-filaments about one-half as long as the sepals, glabrous, anthers brown, orbicular: fruit 8–9 mm. long, the column 5 mm. long, densely hispidulous, abruptly narrowed to a style-beak 1.2–1.5 mm. long, carpel-body about 2.5 cm. long, glabrous or sparsely ciliate; seeds dark-brown, oblong in outline, 1.5 mm. long, 1 mm. wide, roughened with a minute reticulation.

Colombia: Comisaría del Putumayo; Páramo de San Antonio, entre La Laguna de La Cocha y el Valle de Sibundoy, alt. ca. 3000–3200 m., February 13, 1942, *R. E. Schultes 3238* (BH. type); alta cuenca del Río Putumayo, filo de la cordillera entre El Encano y Sibundoy; Páramo de San Antonio de Bordoncillo, alt. 3250 m., January 4, 1941, *J. Cuatrecasas 11741* (US.); road from Sibundoy to Pasto, between La María and Páramo de San Antonio, alt. 2900–3180 m., June 1, 1946, *Schultes & M. Villarreal 7825* (BH.).

Geranium rhomboidale, so named from the shape of the leaf-blade, is related to *G. sibbaldioides*, Benth. from which it differs conspicuously in the less deeply parted 3-lobed leaves with cuneate bases. Although *G. azorelloides*, Sandwith and *G. Jahnii*, Standl. similarly have leaves with cuneate bases, they are very narrow, coriaceous and tridentate at the apex only.

The inflorescence of this species is similar to that of *G. sibbaldioides*, *G. maniculatum* and presumably to that of other species in Knuth's section Andina. Current accounts describe the peduncles as basal. They appear, however, to terminate the woody often underground stem which branches immediately below them. The two outer peduncles are 4-bracteolate, the central 2-bracteolate, indicating, it would seem, an extreme reduction of the inflorescence. The leaves are alternate except for an inner united pair at the base of each branch and in this respect show relationship to the woody Hawaiian species. Further study of this and allied species is required to indicate the true position of the section and to explain satisfactorily the inflorescence structure.

ARTICLE 11.
PETRONYMPHE, A NEW GENUS OF AMARYLLIDACEÆ.

† **PETRONYMPHE,** gen. nov. Tribe Allieæ.

Herba perennis; cormus membranaceo-tunicatus: folia 3–5 linearia subtriangularia elongata scapum fere æquantia, marginibus minute hyalino-denticulatis: inflorescentia scaposa umbellata pluriflora bracteis lanceolatis membranaceis 3–(4?); flores longipedicellati pedicellis bracteatis ad basin florum articulatis; perianthium tubulare superne subventricosum tubo longiore quam segmenta 6 lanceolata, trinervata, suberecta; stamina 6 ad fauces inserta filamentis liberis subulatis et antheris dorsifixis versatilibus secundum longitudinem introdehiscentibus; ovarium stipitatum stylo elongato stigmato haud expanso ovulis ca. 18 axillaribus biseriatis.

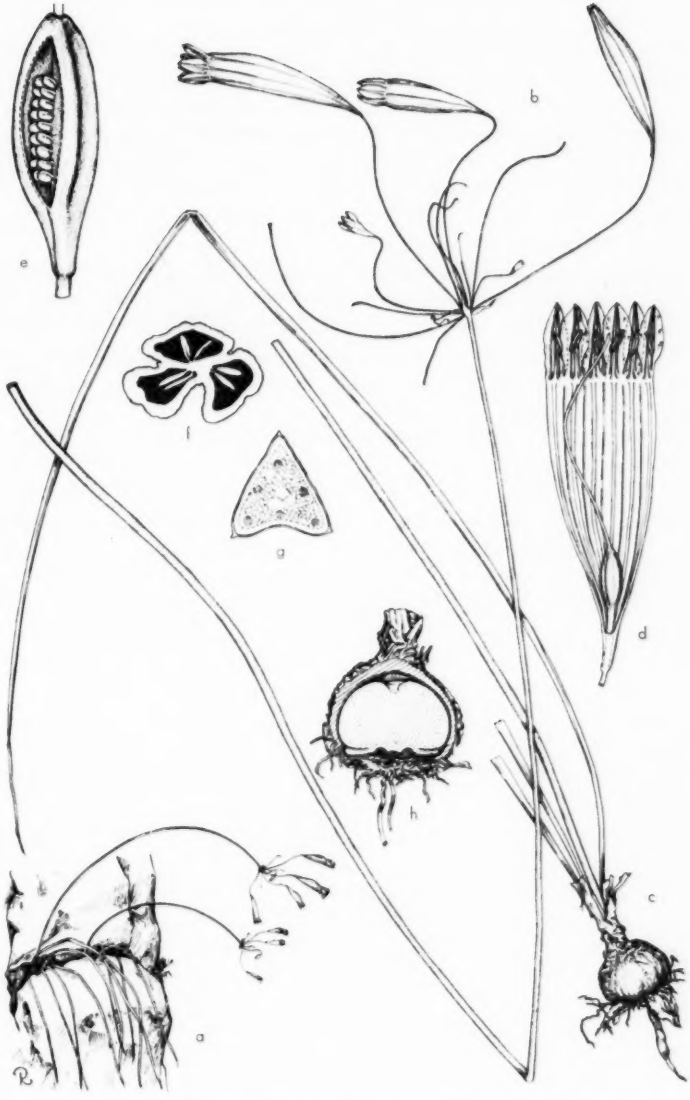
Perennial herb from a membranous-tunicated corm: leaves 3–5, subtriquetrous, linear, elongate, nearly equalling the scape, the margins minutely hyaline-denticulate: inflorescence scapose, umbellate, several-flowered, subtended by 3–(4?) lanceolate membranous bracts; flowers long-pedicellate, the pedicels bracteolate and articulated below the flowers; perianth tubular, the tube slightly ventricose above, much longer than the 6 lanceolate suberect 3-nerved lobes; stamens 6 inserted at the throat, filaments distinct, subulate, anthers about one-half as long as the filaments, dorsifixed, versatile, introrse-dehiscent by longitudinal slits; ovary stipitate, trilocular; style elongate, stigma scarcely enlarged; ovules axillary, about 18 to a locule, biseriate.

† **Petronymphe decora,** spec. nov. Fig. 104.

Cormus 2.2 cm. latus 1.5 cm. altus tunicis membranaceis castaneis nitidis: folia 3, linearia, ad 5 dm. longa 4 mm. lata: scapus glaber arcuatus 5.5 dm. altus; umbella ca. 14 flores ferens bracteis 8 mm. longis; pedicelli floribus longiores ad 8 cm. longi; flores flavovirentes patentes vel penduli perianthii tubo 5 cm. longo lobis 6–7 mm. longis, staminum filamentis 6 mm. longis antheris oblongis cyanoviridibus 3 mm. longis, ovario triangulari 9 mm. longo stipite 10 mm. longo et stylo perianthium fere æquante: fructus ignotus.

Corm 2.2 cm. wide, 1.5 cm. high with a shining castaneous membranous coat and a collar 2.5 cm. high, 7 mm. thick: leaves linear, to 5 dm. long, 4 mm. wide: scape glabrous, arching, 5.5 dm. high; umbel about 14-flowered, lanceolate membranaceous bracts 8 mm. long; pedicels to 8 cm. long, exceeding the spreading or somewhat pendulous yellow-green flowers; perianth-tube 5 cm. long, the lobes 6–7 mm. long; stamen-filaments 6 mm. long, anthers oblong, blue-green, 3 mm. long; ovary three-angled, 9 mm. long, on a stipe 10 mm. long, style slender, nearly equalling the perianth: fruit unknown.

Mexico: Guerrero; cut-over hillsides with lime outcrops near kms.



104. PETRONYMPHE DECORA. a, habit; b, scape $\times\frac{1}{2}$; c, plant $\times\frac{1}{2}$; d, flower expanded $\times 1$; e, ovary with portion of wall removed $\times 5$; f, ovary cross-section $\times 8$; g, leaf cross-section $\times 7$; h, corm vertical section $\times 1$.

337–338 beyond Acahuizotla on highway to Acapulco, alt. ca. 1000 m., September 30, 1949, *Moore 5105* (BH. type).

Petronymphe (rock nymph from πέτρος and νύμφη, pronounced pe tro nim fee) is here placed in the Amaryllidaceæ, tribe Allieæ, as delimited by Hutchinson (J. F. Hutchinson, Families of Flowering Plants, ii, 128, 130, 1934) and appears most closely related to Milla, Triteleia, Triteleiopsis and probably the poorly known Diphalangium (=Milla?), all genera of western Mexico and United States with tunicated corms, 3 or more free spathe-valves, tubular to campanulate perianth and 6 free stamens inserted on the tube or at the throat.

It differs from Diphalangium in having the perianth-tube longer than the segments and probably not adnate to the capsule and in the uniseriate stamens, from Milla in the articulated pedicel and free-stipitate ovary, from Triteleia and Triteleiopsis in the membranous not fibrous-reticulate corm-coat and in the perianth-tube much more than twice exceeding the segments.

Petronymphe decora is a graceful inhabitant of niches and ledges on lime outcrops not far from the village of Acahuizotla in the state of Guerrero, Mexico, where it appears to be extremely local. The plants are gregarious in the wild with lax leaves forming attractive mats hanging over the rocks. The scape is arched with a loose umbel of spreading or pendulous yellow-green flowers contrasting with blue-green anthers. At the time of collection only one plant was seen in flower and fruit was not obtained.